

EVIDENTIARY HEARING  
BEFORE THE  
CALIFORNIA ENERGY RESOURCES CONSERVATION  
AND DEVELOPMENT COMMISSION

In the Matter of: )  
 ) Docket No.  
Application for Certification ) 99-AFC-1  
for the Elk Hills Power Project )  
\_\_\_\_\_)

HEARING ROOM B  
1516 NINTH STREET  
SACRAMENTO, CALIFORNIA

THURSDAY, JANUARY 27, 2000

10:13 a.m.

Reported By:

Valorie Phillips

Contract No. 170-99-001

PETERS SHORTHAND REPORTING CORPORATION (916) 362-2345

COMMITTEE MEMBERS PRESENT

Michal C. Moore, Commissioner

Shawn Pittard, Commissioner Advisor

Major Williams, Jr., Hearing Officer

STAFF PRESENT

Kerry Willis, Staff Counsel

Marc Pryor, Project Siting Manager

APPLICANT

Jane E. Luckhardt, Attorney

Taylor Miller, Attorney

INTERVENOR

Lizanne Reynolds, Attorney  
CURE

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1 P R O C E E D I N G S

2 HEARING OFFICER WILLIAMS: We are here  
3 this morning to conduct evidentiary hearings on  
4 the Application for Certification for the Elk  
5 Hills Power Plant, Docket Number 99-AFC-1.

6 All the hearings in this matter are to  
7 be conducted in Sacramento, in Hearing Rooms A or  
8 B, at the offices of the California Energy  
9 Commission.

10 If there are any interested persons in  
11 the gallery, I would ask that they identify  
12 themselves and come forward.

13 Seeing none, I will continue.

14 All parties who were present at the last  
15 hearing are again present in the hearing room.  
16 Commissioner Moore has stepped out temporarily.  
17 Do the parties have any objection to proceeding  
18 without his presence? He will be returning,  
19 though.

20 MS. WILLIS: No objection.

21 MS. REYNOLDS: We would -- we would  
22 prefer to just wait a few minutes before we begin.

23 HEARING OFFICER WILLIAMS: Okay.

24 MS. LUCKHARDT: Would you like me to at  
25 this time enter -- or offer into evidence the

1 errata to Mr. Cronk's testimony?

2 HEARING OFFICER WILLIAMS: Sure, you can  
3 do that.

4 MS. LUCKHARDT: Which I have provided  
5 today to all the parties. It has been marked as  
6 Exhibit 21-E, and it is the Errata to the  
7 Testimony of Gary Cronk regarding Hazardous  
8 Materials Handling, and includes the corrections  
9 that he made verbally on the record in his  
10 testimony on Tuesday.

11 HEARING OFFICER WILLIAMS: Thank you,  
12 Counsel.

13 Any objections?

14 So admitted, 21-E.

15 (Thereupon, Exhibit 21-E was received  
16 into evidence.)

17 HEARING OFFICER WILLIAMS: Ms. Willis,  
18 would you also -- well, I guess we can wait on  
19 that.

20 As background, on December 22nd the  
21 Committee issued a notice scheduling today's  
22 hearing. During the course of today's hearing,  
23 the Committee will take occasional short recesses,  
24 as well as a lunch break to be announced later.

25 The notice indicated scheduled hearings

1 on January 20, 25, 27, and, if needed, February 1,  
2 2000, to cover many of our topics.

3 On January 20th, we completed ten  
4 topics, although we shifted the subtopic of Water  
5 Injection Wells from Geology to Soil and Water  
6 Resources, to be heard on Tuesday, March 7th,  
7 2000. And on January 25th, we completed four  
8 topics, Land Use, Public Health, Transmission  
9 System Engineering, Transmission Line Safety and  
10 Nuisance, and received evidence on Hazardous  
11 Materials Management.

12 When we left off on Tuesday, CURE was  
13 about to begin its presentation on Hazardous  
14 Materials Management with Dr. Fox.

15 Evidentiary hearings are formal in  
16 nature, similar to court proceedings. The purpose  
17 of the hearing is to receive evidence, including  
18 testimony, and to establish the factual record  
19 necessary to reach a decision in this case.  
20 Applicant has the burden of presenting sufficient  
21 substantial evidence to support the findings and  
22 conclusions required for certification of the  
23 proposed facility.

24 The order of testimony will be taken as  
25 follows for each topic. Applicant, Staff, and

1 CURE. First, we will hear testimony from Dr. Fox  
2 on Hazardous Materials Management. After  
3 completing taking evidence there, we will move to  
4 the topic of Traffic and Transportation, followed  
5 by Waste Management and, finally, Worker Safety  
6 and Fire Protection.

7 COMMISSIONER MOORE: Let me just ask a  
8 question.

9 Phyllis, are you on Worker Safety, as  
10 well?

11 DR. FOX: Yes, I am.

12 COMMISSIONER MOORE: We may move that  
13 sequence around, just so that we can get  
14 consistent. I mean, we -- you've been spending  
15 some pretty long days doing your stuff. I -- we  
16 may --

17 DR. FOX: Fine with me.

18 COMMISSIONER MOORE: We may -- we may  
19 move that around.

20 HEARING OFFICER WILLIAMS: I think  
21 that's consistent with what the Applicant has  
22 requested anyway, because the Applicant has  
23 requested that we not begin Waste before lunch.  
24 So that makes a lot of sense.

25 Thank you, Commissioner Moore.

1                   Witnesses will testify under oath or  
2                   affirmation. During the hearings, the party  
3                   sponsoring a witness shall establish the witness's  
4                   qualifications and ask the witness to summarize  
5                   the prepared testimony. Relevant exhibits should  
6                   be offered into evidence at that time.

7                   At the conclusion of a witness's direct  
8                   testimony, the sponsoring party should move in all  
9                   relevant exhibits to be received into evidence.

10                  The Committee will next provide the  
11                  other parties an opportunity for cross  
12                  examination, followed by redirect and recross  
13                  examination, as appropriate.

14                  Multiple witnesses may testify as a  
15                  panel. The Committee may also ask questions.

16                  Upon the conclusion of each topic area,  
17                  we will invite members of the public to offer  
18                  unsworn public comment. Public comment is not  
19                  testimony, and a Committee finding cannot be based  
20                  solely on such comments. However, public comment  
21                  may be used to explain evidence in the record.

22                  Any questions thus far?

23                  At the beginning of the hearing I passed  
24                  out an exhibit list, a proposed exhibit list.  
25                  Does any party have changes to the proposed

1 exhibit list at this time?

2 Okay. Then I think we are prepared to  
3 begin with Dr. Fox's testimony on Hazardous  
4 Materials Management. She has already been sworn.

5 TESTIMONY OF

6 DR. PHYLLIS FOX

7 called as a witness on behalf of CURE, having  
8 previously been duly sworn, was examined and  
9 testified as follows:

10 DIRECT EXAMINATION

11 BY MS. REYNOLDS:

12 Q Dr. Fox, you have before you a document  
13 entitled Testimony of J. Phyllis Fox, Ph.D., on  
14 behalf of the California Unions for Reliable  
15 Energy on Hazardous Materials Management and  
16 Traffic and Transportation Impacts of the Elk  
17 Hills Power Project, dated January 12th, 2000.

18 A I do.

19 Q Is this your testimony in this  
20 proceeding?

21 A It is.

22 Q Was this testimony prepared by you or  
23 under your direction?

24 A It was.

25 Q Is everything in your testimony true and

1 correct to the best of your knowledge?

2 A It is.

3 Q Can you briefly summarize your  
4 qualifications?

5 A Yes. I have a Bachelor's degree in  
6 physics, an MS and Ph.D. in Environmental  
7 Engineering from UC Berkeley, and about 28 years  
8 of experience doing these types of analyses.

9 Q Have you -- can you briefly describe  
10 your experience with hazardous materials  
11 management issues?

12 A I have done risk of upset consequence  
13 analyses for ammonia and other hazardous materials  
14 for well in excess of a hundred projects over the  
15 past 20-plus years.

16 Q The first issue I'd like to ask you  
17 about is the significance threshold. During both  
18 the Applicant's testimony and staff's testimony,  
19 there was substantial discussion about  
20 significance thresholds. Can you discuss your  
21 views on those?

22 A Surely. Well, there's two parts to the  
23 significance threshold. There's the concentration  
24 part, and there's the probability part. And I  
25 think I'd like to focus most of my remarks on the

1 probability part, because that was the part that  
2 was discussed most intensely on Tuesday.

3 The probability part refers to the  
4 probability that an accident would occur. And in  
5 my experience, most of the public agencies that I  
6 have worked with over the years generally  
7 establish a significance threshold for the  
8 probability of an accident occurring of somewhere  
9 between one in a million and a hundred in a  
10 million, or one in a hundred thousand.

11 Many of the agencies that I've worked  
12 for don't even allow the consideration of  
13 probability. For example, the South Coast Air  
14 Quality Management District, which is the largest  
15 air district in the state, in fulfilling its  
16 obligations under CEQA does not allow one to  
17 consider probability at all. One simply looks at  
18 the consequences. If the consequences could  
19 result in significant offsite impacts, which are  
20 characterized as either significant irritation or  
21 death, then one considers the impact to be  
22 significant and impose mitigation.

23 Other agencies consider probability.  
24 It's quite variable around the state. But in most  
25 cases, I have run into significance thresholds of

1       one in one million to a hundred in one million.

2               In the Energy Commission proceedings, I  
3       personally am confused as to what the Commission's  
4       significance threshold is. In most of the written  
5       -- well, in all of the written materials that I  
6       have seen, Preliminary Staff Assessments and Final  
7       Staff Assessments, the only probability  
8       significance threshold that I have ever seen  
9       mentioned is one in a million as a de minimus  
10      level.

11             Usually, one in a million is attached to  
12      the words "de minimus level". Sometimes you'll  
13      see one in a million without that language  
14      associated with it. And I always assumed in the  
15      work that I've done on these various projects that  
16      if the probability was less than one in a million,  
17      then it was de minimus and not significant, and if  
18      it was greater than that, then it would be  
19      significant.

20             We have learned now, in the Sunrise  
21      case, based on Mr. Tyler's testimony, that he  
22      considered a probability to be significant if it  
23      is one in ten thousand --

24             MS. LUCKHARDT: I want to object to  
25      this. If she's talking about testimony in

1 Sunrise, I believe that that has been specifically  
2 held as being not admissible in this case.

3 MS. REYNOLDS: Could I respond to that?

4 COMMISSIONER MOORE: Go ahead.

5 MS. REYNOLDS: The issue that we're  
6 dealing with here is the moving target of -- what  
7 appears to be a moving target of staff's  
8 significance standard, and I think it's important  
9 to --

10 COMMISSIONER MOORE: Well, I think,  
11 Counselor, that the point that Dr. Fox is raising  
12 as an opinion about whether or not the Energy  
13 Commission has opined as to a standard is -- is  
14 relevant. To have her reference another case,  
15 even though I'm Presiding Member of that other  
16 case, I think can't -- can't come in. So to go  
17 back one step, let her -- let her talk about what  
18 the Energy Commission has published and what's on  
19 the record from this agency, I think is fair. But  
20 to -- to reference the other case in this case, I  
21 think that's probably off -- off bounds.

22 So I'll uphold Jane's objection, and  
23 just ask her to stay with what's -- what's  
24 published. I understand the point she's making,  
25 and let's -- but let's just stay with what's --

1       what's the published stuff, as opposed to going  
2       back into testimony that was brought in another  
3       case.

4               MS. LUCKHARDT: I would not have an  
5       objection if she were referring to an officially  
6       published decision of the Commission on a previous  
7       case. But when she's talking about testimony in  
8       Sunrise, I feel that we've explicitly let that  
9       out.

10              COMMISSIONER MOORE: I think I just said  
11       that, but --

12              MS. LUCKHARDT: Yes. Yeah, I --

13              COMMISSIONER MOORE: Okay.

14              MS. LUCKHARDT: -- I believe that's what  
15       you said. I'm sorry.

16              MS. REYNOLDS: I think that this issue  
17       goes -- that this goes to a credibility issue of  
18       if staff is changing its mind about what is the  
19       significance tendered in other cases --

20              COMMISSIONER MOORE: I -- you know, I  
21       think we're going to have to let what -- what  
22       staff has said stand, and if -- if what's been  
23       said in this case in front of us -- I'm sorry. If  
24       Dr. Fox, for instance, felt that what had been  
25       said in this case was contradictory or not clear,

1       that's fair game, and that's -- that's a comment  
2       that she's certainly capable of making. But -- or  
3       authorized to make. But -- and also to talk to  
4       published decisions or documents -- let's keep it  
5       --

6               THE WITNESS: Okay.

7               HEARING OFFICER WILLIAMS: Do you want  
8       to re-ask the question, Counsel?

9               MS. REYNOLDS: I'll -- let's just get it  
10      -- I'll get it started again.

11              BY MS. REYNOLDS:

12              Q     On Tuesday, staff articulated a  
13      significance standard dealing not with  
14      probabilities of accidents, but related to how  
15      many people would die if an accident occurred.  
16      Can you address that?

17              A     Yes. On Tuesday, I heard for the first  
18      time that the significance threshold is now if  
19      there is one fatality the probability threshold is  
20      one in ten thousand. If there are ten fatalities,  
21      the probability threshold is one in a hundred  
22      thousand. And if there are a hundred fatalities,  
23      then the probability threshold is one in a  
24      million.

25              This is the first time in all of the

1 Energy Commission's published opinions and oral  
2 testimony that I have heard in which the  
3 probability threshold was linked to a fatality. I  
4 personally feel like I'm dealing with a moving  
5 target with the significance threshold for  
6 hazardous materials events. And I would urge the  
7 Commission to investigate this issue and make a  
8 decision on what the significance threshold will  
9 be in this and other cases, and that it be adhered  
10 to, because it's very difficult for an Intervenor  
11 such as us to do a meaningful analysis when the  
12 probability threshold that we're trying to deal  
13 with is constantly shifting.

14 Anyway, that aside, irrespective of  
15 which of staff's many probability thresholds that  
16 have been tossed out there, I still believe that  
17 the potential failure of the ammonia storage tank  
18 and ancillary facilities in this case would result  
19 in a significant impact.

20 Q Can you first discuss the catastrophic  
21 tank failure scenario and why you think the  
22 impacts are significant from that?

23 A Okay. I need to use the overhead.

24 COMMISSIONER MOORE: I think it -- will  
25 it show if we dim the lights on this wall?

1 MS. REYNOLDS: Well, it's actually  
2 showing fine without dimming the -- let's try and  
3 see what --

4 COMMISSIONER MOORE: Oh, all right.  
5 Fine. Good.

6 (Pause.)

7 COMMISSIONER MOORE: Great.

8 THE WITNESS: Can you hear me okay?

9 (Inaudible asides.)

10 HEARING OFFICER WILLIAMS: Dr. Fox, will  
11 you first identify the exhibit that you're  
12 discussing, before you get into your --

13 THE WITNESS: Yes. On the overhead is  
14 Figure 3.2-2 from the AFC, and it's entitled Power  
15 Plant Location and Nearby Roads.

16 MS. LUCKHARDT: I have a question about  
17 the numbers that are on -- on this figure. Is  
18 this now a new exhibit that we've created and that  
19 we're seeing for the first time here?

20 MS. REYNOLDS: No, that we have no  
21 intention of entering this as an exhibit. This is  
22 for illustrative purposes.

23 THE WITNESS: These are also not new  
24 numbers. Those are distances, so that I didn't  
25 --

1 MS. LUCKHARDT: Okay. Well, maybe if  
2 you just -- if you can tell me what they are, then  
3 I can decide whether I need to object.

4 THE WITNESS: The blue numbers are  
5 distances in feet between the ammonia storage tank  
6 and the points where they're written.

7 MS. LUCKHARDT: Okay. Thank you.

8 THE WITNESS: Okay. In order to  
9 understand why we are concerned about the ammonia  
10 tank failure you need to understand the geometry  
11 of the project, which is why I have this figure up  
12 here.

13 The project is the area here that I'm  
14 outlining in red. This is the project site.  
15 Okay. And the ammonia storage tank is down here  
16 in this corner. I've highlighted it in yellow.  
17 And the thing that I want you to notice is that  
18 immediately surrounding the project site there are  
19 a number of locations where workers would be  
20 present.

21 For example, immediately below the  
22 project site is the 35R LOAP plant, which is the  
23 gas plant. The distance from the ammonia tank to  
24 the boundary of the LOAP plant where there's a  
25 pipe rack is a hundred feet. And the distance

1 from the ammonia storage tank to the nearest  
2 building where you might find workers is 350 feet.  
3 There's an administrative complex over here. The  
4 distance from the ammonia storage tank to the  
5 administrative complex down here is 825 feet.

6 Over here, on the west side of the Elk  
7 Hills site is what is labeled the 35R cogen  
8 facility. That's another power plant. And the  
9 distance between the ammonia storage tank and the  
10 fence line of this 35R cogen is 700 feet.

11 There are oil wells on most of the four  
12 corners of the plant. There's an oil well right  
13 here on the southwest corner, which is only 150  
14 feet from the ammonia storage tank.

15 HEARING OFFICER WILLIAMS: Dr. Fox,  
16 would you indicate that mark with some description  
17 so that we'll be able to later tell that you were  
18 speaking of an oil well?

19 THE WITNESS: Yes, it's Oil Well Number  
20 372M, I believe.

21 HEARING OFFICER WILLIAMS: Oh, it's  
22 already there?

23 THE WITNESS: Yes, there's a label on  
24 it.

25 ///

1 BY MS. REYNOLDS:

2 Q Dr. Fox, I think you said northeast  
3 corner. I think that's -- I believe that's the  
4 southeast corner.

5 A Southeast corner. Thank you.

6 There's another oil well in the  
7 northeast corner, Well -- looks like 37. Then to  
8 the north of the plant, 750 feet from the ammonia  
9 storage tank, there's a -- some sort of facility  
10 here. I'm not sure exactly what it is, but it  
11 shows tanks, and you'd expect to find workers  
12 there. And then the entrance to the facility,  
13 where I assume there would be a guard stationed,  
14 is 1125 feet from the ammonia storage tank. And  
15 then finally, we have Elk Hills Road running  
16 north/south to the west of the facility, and the  
17 distance between the ammonia storage tank --

18 Q I think that's the east.

19 A That's the east? I'm from the east  
20 coast, and I always look my directions --

21 (Laughter.)

22 THE WITNESS: Okay. To the east of the  
23 facility, the Elk Hills Road, which is a public  
24 road, runs from north to south, and the distance  
25 between the ammonia storage tank and the closest

1 point on Elk Hills Road is 700 feet.

2 So, you can see that on all four sides  
3 of the power plant site there are locations where  
4 you would expect to find workers, in the LOAP  
5 plant, in the other cogen plant, at the wells on  
6 the four corners, in the facility north of the  
7 plant, at the guard gate, and then finally you  
8 would have motorists traveling along Elk Hills  
9 Road.

10 So there are a number of public  
11 receptors around this facility that could be  
12 impacted by an accident involving this ammonia  
13 storage tank.

14 BY MS. REYNOLDS:

15 Q Dr. Fox, there is another overhead  
16 you've placed -- another slide you've placed on  
17 the overhead. Can you describe that for the  
18 record?

19 HEARING OFFICER WILLIAMS: Counsel,  
20 before we get there, are you going to be  
21 introducing a copy of this overhead into the --  
22 into the -- that Dr. Fox just discussed into the  
23 record?

24 MS. REYNOLDS: That -- I think that's  
25 apparent from what's already in the record. It's

1 part of the AFC, and there's a scale on the AFC,  
2 so --

3 COMMISSIONER MOORE: All you did was  
4 derive those -- those blue distances from the  
5 scale that was on the overhead that we just saw?

6 THE WITNESS: That's right, the scale on  
7 the overhead is about eight-tenths of an inch to  
8 200 feet, and I simply scaled off the distances  
9 between the --

10 COMMISSIONER MOORE: Okay. So all  
11 you're doing is you're building up information to  
12 make an argument here, pretty soon.

13 THE WITNESS: Right. I'm building up  
14 information to make an argument that an accident  
15 involving the ammonia storage tank would have a  
16 significant impact, is what I'm doing. And I'm  
17 using all of the Applicant's information at this  
18 point.

19 COMMISSIONER MOORE: I understand.

20 BY MS. REYNOLDS:

21 Q Okay. This next slide, can you identify  
22 that for the record?

23 A The next slide is the Applicant's  
24 analysis of the consequences of an accident  
25 involving the ammonia storage tank. And this is

1 Table 1, out of the Applicant's response to Staff  
2 Data Request 9. And the table is entitled --

3 MS. LUCKHARDT: Before you -- before you  
4 continue, could you just clarify, are those  
5 distances simply a calculation from meters to  
6 miles?

7 THE WITNESS: Yes. The blue column  
8 that's labeled miles, to the right of the meter  
9 column, is a conversion of the meters and the  
10 miles, because most people don't think in terms of  
11 meters. So I wanted to put it in miles so people  
12 could relate to it.

13 MS. LUCKHARDT: I -- all I want is  
14 clarification so that I know what you've got  
15 presented up there is something that I can accept.

16 You have some other information on there  
17 regarding schools and residences that does not  
18 look familiar to me.

19 THE WITNESS: On the -- on the right-  
20 hand column, on the right-hand side in blue, there  
21 -- it says 10,500 meters and school. That's out  
22 of the staff's FSA, and it's the distance between  
23 the project site and the nearest school in Tupman.  
24 All I did was convert --

25 MS. LUCKHARDT: Okay. That's --

1 THE WITNESS: -- staff's number --

2 MS. LUCKHARDT: -- that's -- so you've  
3 put meters there.

4 THE WITNESS: -- into meters. And --

5 MS. LUCKHARDT: Okay, because I thought  
6 that was miles, and that looked different --

7 THE WITNESS: No, that's meters. And  
8 then the second number, residence, is again from  
9 staff's testimony, and it's the distance from the  
10 project site to the nearest residence, in meters.

11 MS. LUCKHARDT: Okay. Thank you.

12 THE WITNESS: Okay. The -- there are  
13 two tables on here. The top table is what's  
14 referred to as the worst case scenario, which is  
15 the catastrophic failure of the tank and the  
16 release of its contents in ten minutes. And two  
17 cases were analyzed, an uncontrolled release and a  
18 controlled release. And the Applicant is assuming  
19 a water deluge system to control ammonia releases.  
20 Basically, a bunch of nozzles that spray water at  
21 the release. And the left-hand column assumes  
22 that that deluge system does not work. And the  
23 right-hand column assumes that it does work.

24 And for your information, the EPA, in  
25 doing consequence analyses under the RMP, require

1       that you assume that these deluge systems don't  
2       work in this kind of worse case analysis because  
3       it's a passive system and, in fact, they fail  
4       often and they're not very effective, particularly  
5       for catastrophic releases.

6                Anyway, if you look at the numbers on  
7       the left-hand side, the first column here --

8                COMMISSIONER MOORE:   Excuse me, Dr. Fox.  
9       That's a fairly provocative statement.  Is -- is  
10      there published data that would indicate the  
11      failure rate of these systems, and/or their --  
12      their effectiveness, if there's a surrogate for  
13      effectiveness?  Is there a published document that  
14      I can go to to see what's happened?

15               THE WITNESS:  Yes.  I can refer you to  
16      two things.  The Applicant relied on a RMP done  
17      for El Centro Irrigation District, and they  
18      discuss the effectiveness of these systems.  And  
19      if you use the numbers in there, you will -- you  
20      would conclude that in a large release like this  
21      you would get at most 15 percent control of the  
22      release.

23               MS. REYNOLDS:  That --

24               THE WITNESS:  Another source --

25               MS. REYNOLDS:  Pardon me.  That's

1 attached as an exhibit to Dr. Fox's --

2 THE WITNESS: Right. That's discussed  
3 in my testimony.

4 And then --

5 HEARING OFFICER WILLIAMS: Where is  
6 that, Counsel? Is it -- what -- can you point us  
7 to it?

8 COMMISSIONER MOORE: Dr. Fox, why don't  
9 you go on, and your Counsel can give us that  
10 reference when she finds it.

11 MS. REYNOLDS: That is -- pardon me,  
12 that's Exhibit I, to Dr. Fox's testimony.

13 HEARING OFFICER WILLIAMS: Thank you.

14 THE WITNESS: The other source is a book  
15 called Guidelines for Post-Release Mitigation  
16 Technology in the Chemical Process Industry. It's  
17 an American Institute of Chemical Engineers book,  
18 and Mr. Radis was one of the authors of it and  
19 it's talked about in his direct testimony.

20 In there, there's a chapter on water  
21 deluge systems, and on page 72 of that book it  
22 says the following about water deluge systems.  
23 While effective for small spills, deluging alone  
24 is not practical for large spills. The effects of  
25 deluging can be significant in reducing hazard

1 zones in the near field close to the source. The  
2 effect of deluging on reducing concentrations at  
3 large downwind distances, however, is small.

4 It goes on to say, if the release is a  
5 two-phase jet, which would be the case in these  
6 catastrophic tank failures that we're talking  
7 about here, and has a momentum that is larger than  
8 that of the water spray, which would much -- be  
9 very likely because these are catastrophic  
10 failures where you release a lot of stuff very  
11 quickly, then that -- well, let me start over.

12 If the release is a two-phase jet and  
13 has a momentum that is larger than that of the  
14 water spray, the jet will penetrate the water  
15 spray with little interaction, which will lead to  
16 a poor removal efficiency.

17 So that's the kind of performance that  
18 you might expect for a catastrophic failure like  
19 we're talking about here on this figure.

20 The first column on both of these tables  
21 is the exposure level, and these are staff's  
22 significance criteria for the concentration part  
23 of the significance equation. The 75 ppm exposure  
24 level is the lowest one that staff uses, and it's  
25 based on a 30 minute exposure and results in

1 significant irritation to most people who are  
2 exposed.

3 I won't bore you going through all of  
4 them, but the bottom one, the 2,000 ppm level, is  
5 a level that staff characterizes as the lethality  
6 level, based on a 30 minute exposure. And the  
7 numbers in this second column, hazard zone  
8 distance, is the distance from the ammonia storage  
9 tank to the point where those concentrations in  
10 the exposure level column are experienced. In  
11 other words, if you look at the 75 ppm, you would  
12 experience a concentration higher than or up to 75  
13 ppm at a distance of up 10,710 meters from the  
14 ammonia storage tank. In other words, that's 6.7  
15 miles, if you don't think in -- think in meters.

16 So up to 6.7 miles from the ammonia  
17 storage tank you would have a concentration of  
18 ammonia that was high enough to result in  
19 significant irritation in most people who would be  
20 exposed.

21 Now, what -- what would be in that 6.7  
22 mile radius? This is also out of the Applicant's  
23 response to Staff Data Request 9, and these are  
24 isopleths. What they have done is they've taken  
25 the distances in the previous table that we were

1        talking about, and plotted them in a concentric  
2        circle around the plant site. So this outer  
3        circle is the 75 ppm contour, and everything from  
4        the outer boundary of this circle to the plant  
5        site would have a concentration of ammonia of at  
6        least 75 ppm, and as you move closer to the plant  
7        site it would be a lot higher than that.

8                    BY MS. REYNOLDS:

9            Q        Dr. Fox, for the record, I just want to  
10       identify that this is Figure 1, worst case  
11       scenario, out of the Applicant's response to Staff  
12       Data Request 9.

13           A        Thank you.

14                    HEARING OFFICER WILLIAMS: Thank you,  
15       Counsel.

16                    THE WITNESS: Now, let's look and see  
17       what is within this circle. On the east side we  
18       see the town of Tupman. The 75 ppm circle  
19       encompasses most of the town of Tupman, which  
20       includes at least one school, which is identified  
21       in the FSA. It also encompasses the town of Derby  
22       Acres, the town of Valley Acres, an airport, the  
23       Button/Kern County Airfield on the northern  
24       portion of the figure, and it encompasses a large  
25       segment of Highway 119 on the southern portion of

1 the circle, as well as a big chunk of Elk Hills  
2 Road, which starts at the bottom of the circle and  
3 moves north up to the plant site.

4 So, in this 75 ppm isocontour, you have  
5 a large number of sensitive receptors, members of  
6 the public, school children, and motorists who may  
7 be present during an accident.

8 Now, that's the worst case, that's the  
9 catastrophic tank failure, which has a probability  
10 based on the Applicant's calculations of 3.7 times  
11 ten to the minus five, which is basically four in  
12 a hundred thousand. And you can see that for that  
13 case, you could have significant impacts within  
14 the 75 ppm isocontour for a fairly large number of  
15 people.

16 Now, let's turn our attention to a  
17 little more probable scenario. In the bottom part  
18 of the table there's another scenario called the  
19 alternate case scenario.

20 HEARING OFFICER WILLIAMS: Dr. Fox,  
21 you're back to Table 1 now?

22 THE WITNESS: Yes. I'm back to --

23 MS. REYNOLDS: The Applicant's response  
24 to Staff Data Request 9.

25 THE WITNESS: Table 1, summary of

1 offsite consequence analysis modeling results.

2           The bottom table, which is labeled  
3 alternate case scenario, is for an accident  
4 involving a leak in a pipe or a valve associated  
5 with the table. And the release is assumed to be  
6 5.4 kilograms per second over a 30 minute period,  
7 with a probability of 2.43 times ten to the minus  
8 three per year. So it's significantly more  
9 probable than the previous release that we were  
10 talking about.

11           And I'd like to now go to -- back to  
12 Figure 3.2-2, from the AFC. And what I have done  
13 is I have taken the distances to various  
14 concentration levels from that bottom table and  
15 plotted them up on Figure 3.2-2 --

16           MS. LUCKHARDT: I believe this is a new  
17 -- a brand-new exhibit that has not previously  
18 been entered. And so I'm going to have to object  
19 to the introduction and the use of this exhibit.

20           MS. REYNOLDS: My response to that is  
21 that this is merely a depiction of what the  
22 Applicant has already put into the record. And I  
23 don't think -- it's not any new information. The  
24 fact that we have combined two pieces of data onto  
25 one exhibit -- it isn't new data.

1                   COMMISSIONER MOORE: Yeah, I -- I tend  
2                   to agree. Where the -- where the calculation is  
3                   -- I mean, if there were new original research  
4                   that Dr. Fox is bringing in based on something  
5                   that she has done at the site, then I -- I think  
6                   I'd concur with the Applicant. But in this case,  
7                   to take data that's in one table, translate it  
8                   onto a map and -- and depict it, in a sense,  
9                   making a novel use of already published data, I  
10                  think is -- is okay. Certainly it's nothing new  
11                  here, simply portrayed in a different way.

12                 MS. LUCKHARDT: I guess my objection to  
13                  this is that we haven't had an opportunity to  
14                  properly check the distances that she has plotted  
15                  and the information that's provided there, so we  
16                  have no way of knowing whether it's accurate or  
17                  not.

18                 MS. REYNOLDS: The -- well, this is not  
19                  going to be entered as an exhibit. Dr. Fox will  
20                  verbally state what falls within the 2,000 parts  
21                  per million vicinity, and you can rebut that if  
22                  you want.

23                 HEARING OFFICER WILLIAMS: I think  
24                  that's what we'll do. Continue, Dr. Fox. We will  
25                  -- Counsel, you will have an opportunity at some

1 point to rebut whatever information this contains.

2 COMMISSIONER MOORE: You know, sorry to  
3 interrupt, Major, for just one second. But Jane  
4 raises a good point. Where -- where a calculation  
5 hasn't had time to be checked, because of the  
6 possibility of an error in the -- in the portrayal  
7 of it, she's right. Counsel, I will offer -- you  
8 can -- we'll get this on the record, you take it.  
9 If you find an error and you want to come back and  
10 readdress it, we'll open this back up again and  
11 you can take it on.

12 MS. LUCKHARDT: Okay.

13 HEARING OFFICER WILLIAMS: Go ahead, Dr.  
14 Fox.

15 THE WITNESS: Anyway, what I have done  
16 here is taken the distances from Table 1 and  
17 plotted them on Figure 3.2-2, so you can see which  
18 of the nearby receptors would be impacted by the  
19 accident involving the -- the valve or piping  
20 failure.

21 BY MS. REYNOLDS:

22 Q So, I want to clarify, Dr. Fox, that  
23 this is not depicting the catastrophic tank  
24 failure?

25 A No. This is what is referred to as the

1       alternate worse case, which involves a accident  
2       involving a valve or a pipe failure, which has a  
3       7.3 percent chance of occurring over the life of  
4       the project. It's quite common, actually.

5               The thousand ppm significance level,  
6       which is used by staff, would encompass all of the  
7       receptors that I spoke about previously. It would  
8       encompass the administrative complex next to the  
9       LLP gas plant; it would encompass most of the LOAP  
10      gas plant; it would encompass several of the wells  
11      at the boundary of the facility; and it would  
12      encompass a very significant stretch of Elk Hills  
13      Road.

14             The 2,000 ppm contour, which is this  
15      inner circle, would encompass a good portion of  
16      the LLP gas plant, and a couple of the wells. The  
17      2,000 ppm contour, you might remember, is the  
18      lethality level.

19             MS. LUCKHARDT: Could you clarify  
20      whether that -- those numbers are the mitigated or  
21      unmitigated numbers for the --

22             THE WITNESS: They're the mitigated.  
23      It's --

24             MS. LUCKHARDT: Okay.

25             THE WITNESS: See, it's -- in the upper

1 right-hand corner it says controlled --

2 MS. LUCKHARDT: Okay. I -- I'm sorry, I  
3 didn't see that when I was looking.

4 THE WITNESS: So these contours that  
5 we're talking about are assuming that the water  
6 deluge system works as planned, and these types of  
7 accidents have a probability of seven percent over  
8 the lifetime of the project occurring. So you can  
9 clearly see that if you are a worker in this gas  
10 plant or a worker in the oilfield at one of the  
11 wells on the corners of the facility, or you're a  
12 motorist along Elk Hills Road, that you would have  
13 a significant chance of being impacted by an  
14 accident involving that ammonia storage tank.

15 COMMISSIONER MOORE: That's depending on  
16 which way the wind's blowing.

17 THE WITNESS: Depending on which way the  
18 wind is blowing. And in the case of Elk Hills  
19 Road, the wind blows that direction about 25  
20 percent of the time.

21 BY MS. REYNOLDS:

22 Q Dr. Fox, I guess this is a nice segue  
23 into meteorological conditions. Can you address  
24 issues that were raised during staff testimony and  
25 Applicant testimony about the probability --

1       reducing the probability by the worst case met  
2       condition?

3             A     Yes.   What --

4                   HEARING OFFICER WILLIAMS:   Counsel --  
5       excuse me, Dr. Fox.   I'm going to request that you  
6       make exemplars of these documents as a separate  
7       exhibit, and distribute those to the Applicant and  
8       staff so that they'll have an opportunity to have  
9       -- have the documents in front of them.   Thank  
10      you.

11                   MS. REYNOLDS:   We will do that.

12                   HEARING OFFICER WILLIAMS:   Thank you.

13                   BY MS. REYNOLDS:

14             Q     So can you address the met condition  
15       issue and the probability associated with met  
16       conditions?

17             A     Yes.   What staff does when they analyze  
18       the consequences of an accident like this is they  
19       calculate the probability of the accident  
20       occurring, and then in calculating the  
21       consequences you always have to assume a wind  
22       speed and a stability class.   A stability class is  
23       jargon for the amount of turbulence in the  
24       atmosphere.   And the more turbulence there is in  
25       the atmosphere, the more likely the release is to

1 mix and not cause a problem.

2 Likewise, the higher the wind speed, the  
3 faster the -- the material will be pushed out and  
4 the more likely it is to mix into the atmosphere.

5 So in doing these analyses you usually  
6 use worst case conditions, which are what's  
7 referred to as F stability and a wind speed of 1.5  
8 meters per second. And that's how these analyses  
9 that we were talking about previously were done.

10 Well, what staff does then is they take  
11 the probability of the accident occurring and they  
12 multiply it by the percent of the time that that  
13 particular met condition would occur. And any  
14 specific met condition has a very low probability  
15 of occurring. For example, staff claims that  
16 F stability and wind speeds of 1.5 meters per  
17 second occur only two percent of the time. So you  
18 take a relatively high probability of a tank  
19 failure and you multiply it by a very small  
20 number, you always come out with a very small  
21 number and you're always left concluding that the  
22 event is not significant.

23 Well, in my experience, that's not how  
24 it's done. I have never run into a situation  
25 where the probability of the tank failure or some

1 other type of failure was multiplied by the  
2 probability that the meteorological conditions  
3 would occur. What I have seen more commonly is  
4 that you analyze a range of meteorological  
5 conditions, and what you will find is that the  
6 most commonly occurring meteorological conditions,  
7 those occurring 75 percent of the time, would  
8 still result in a significant impact.

9 Q Is that --

10 A In other words --

11 Q Is that your conclusion in this case,  
12 Dr. Fox?

13 A That's my conclusion in this case. In  
14 other words, if you were to use a stability class  
15 of A and a wind speed of three meters per second,  
16 or a stability class of B and a wind speed of  
17 four, or of C and four, or of B and four, or of E  
18 and four --

19 MS. LUCKHARDT: I'd like to object to  
20 the continued having the witness stand in the  
21 center of the room, if she's finished with using  
22 the overhead.

23 MS. REYNOLDS: Okay.

24 COMMISSIONER MOORE: Are you finished  
25 with the overhead stuff, Dr. Fox?

1 THE WITNESS: No, I'm not.

2 COMMISSIONER MOORE: All right. Let me  
3 ask you a question before --

4 MS. LUCKHARDT: Oh, I'm sorry. I --

5 COMMISSIONER MOORE: The animation  
6 objection is -- is upheld. And so we'll confine  
7 her to a two meter zone around the --

8 (Laughter.)

9 COMMISSIONER MOORE: -- around the --

10 THE WITNESS: Do I understand I have to  
11 stay here?

12 (Laughter.)

13 COMMISSIONER MOORE: Well, I think  
14 Jane's made a good point. I can't see the  
15 expressions of -- of concern on Counsel's face  
16 when you're blocking her from me, so I -- I don't  
17 know when she's just about to erupt off the table  
18 and say something.

19 So let me -- let me ask you this. Do  
20 you, in what you just said, disagree with that 7.3  
21 percent figure?

22 THE WITNESS: No, I don't.

23 COMMISSIONER MOORE: What you're  
24 disagreeing with, just for my own edification, is  
25 that you disagree with using a single metric, in

1       this case the 25 percent figure that you referred  
2       to before that the wind would blow towards Elk  
3       Hills Road. So you're saying that single metric  
4       which normally, at least in -- they're always  
5       straightforward, probably among the analyses,  
6       would've been just .25 times .07 to get the -- to  
7       get the result.

8                You're saying no, what you're trying to  
9       do is to build a different metric that averages or  
10      somehow combines a number of different  
11      probabilities on the meteorological side with the  
12      7.3 percent number.

13               THE WITNESS: Yes. The point that I'm  
14      trying to make is if you re-did the analysis that  
15      the Applicant did, as reflected in this figure,  
16      and you did it for different combinations of  
17      meteorological conditions -- in other words, you  
18      throw out the stability class of F and the 1.5  
19      meters per second and you re-did the analysis for  
20      the most commonly occurring meteorological  
21      conditions, that's A3, B4, B4, E4, et cetera, you  
22      would find in each and every case that you would  
23      still have a significant consequence, a  
24      significant impact on motorists along Elk Hills  
25      Road and on workers in the facility immediately

1 surrounding the boundary of the plant.

2 COMMISSIONER MOORE: Okay. I understand  
3 your point. I -- you've changed -- you offered a  
4 different methodology, and it's -- they obviously  
5 result -- I can do the math in my head on that one  
6 -- they obviously result in a -- in a order of  
7 magnitude difference in terms of the significance.  
8 The point's made.

9 BY MS. REYNOLDS:

10 Q Dr. Fox, can you -- you just stated that  
11 you would still have a significant impact. Can  
12 you define what you were using as a significance  
13 standard when you come to that conclusion?

14 A I personally feel that a significance  
15 standard of one in a hundred thousand should be  
16 used. But if you were to take staff's stated  
17 significance standard in this case of one in a  
18 hundred -- one in ten thousand for one fatality,  
19 you would still have a significant impact.

20 And, in fact, if you take staff's 2,000  
21 ppm lethality concentration, which is one of the  
22 exposure levels that they use for a significance  
23 criteria, and you convert it into a one second  
24 exposure concentration, using Haber's law, you  
25 will get a concentration of 10,700 ppm. That's a

1 concentration that would kill you within exposure  
2 of one second. If you did that calculation, and  
3 looked at the motorists along Elk Hills Road for  
4 the worst case tank scenario, you would find that  
5 you would have the potential of killing up to a  
6 hundred motorists on this road, assuming staff's  
7 estimates of peak traffic of 90 cars or 90  
8 vehicles per hour.

9 And with respect to the manipulation  
10 using the meteorological conditions you heard Mr.  
11 Radis testify on Tuesday that the EPA RMP  
12 guidelines don't even allow the consideration of  
13 probability. When I get back in my chair I'll  
14 read you an excerpt out of the guidelines. They  
15 specifically prohibit it.

16 And the same is true for the CalArp  
17 program. And that's because accidents happen.  
18 And what those federal and state programs are  
19 trying to do is to figure out what the  
20 consequences are, and if the consequences are  
21 significant, then implement changes in mitigation  
22 to make sure that when the accident does happen  
23 that it doesn't cause a significant impact. So it  
24 doesn't even entertain a probability analysis of  
25 any kind.

1           Other agencies allow considering the  
2       probability of the accident itself, but I've never  
3       seen an agency that uses meteorological conditions  
4       in this way. The book that Mr. Radis referenced  
5       page 232, the -- the AICHE transportation  
6       guideline, what that is for is a probability  
7       analysis where you determine the impact of an  
8       individual person standing at a point.

9           If you've got, say, Commissioner Moore  
10      sitting over there and you've got an ammonia  
11      storage tank here, and you want to calculate the  
12      probability that Mr. Moore is going to die, then  
13      you would multiply your probability of a tank  
14      failure by the percent of the time that the wind  
15      blows towards Mr. Moore. But not even that  
16      guideline anticipates the use of wind speed and  
17      stability class in the probability calculation.

18           COMMISSIONER MOORE: Okay. Well, Dr.  
19      Fox, let me see if I understand where you're going  
20      with this.

21           The probability calculations and the  
22      statistics I find actually fascinating, but I'm  
23      not sure that everyone else is going to share that  
24      with me. On the other hand, your objective is to  
25      describe -- if I'm following on from what you said

1 before -- what happens when an accident occurs.  
2 You accept that at some point accidents happen,  
3 and so aren't you really going to the control  
4 technology that is -- that solves the problem when  
5 they happen? Is that where you're headed?

6 THE WITNESS: Yes. That's where --  
7 that's where I want to go. I believe, based on  
8 the facts in this case, that the consequences of an  
9 accident involving the ammonia storage tank are  
10 significant. You've got a motorist out there very  
11 close to the plant. You've got a public road  
12 that's only 700 feet away, and within the 75 ppm  
13 isocontour you have three towns, schools, and  
14 large segments of two public roads. You're  
15 clearly going to have an impact on those people if  
16 there's an accident involving these tanks.

17 The accident probability for the  
18 alternate case scenario, which is quite probable,  
19 is significant.

20 BY MS. REYNOLDS:

21 Q Dr. Fox, can you explain what the  
22 alternate -- just clarify what the alternate worst  
23 case scenario is?

24 A The alternate worst case scenario  
25 involves a failure of a valve or a pipe associated

1 with the tank. And the Applicant's probability  
2 analysis found the probability of such an accident  
3 to be about seven percent over the project's  
4 lifetime, which is 30 years. And that's  
5 significant, to me.

6 I have -- I have more overheads, but  
7 maybe the point is made and I don't need them.

8 Q Yeah. Dr. Fox, I think we can move on  
9 to discussion of mitigation measures. You  
10 recommended several mitigation measures in your  
11 written testimony. And on Tuesday, the Applicant  
12 and staff's witnesses had some comments about  
13 those mitigation measures. Could you address  
14 those?

15 A I'll sit down for awhile, but I need to  
16 come back up later.

17 Q Could you -- one of the mitigation  
18 measures you suggested was a double-walled tank.  
19 And can you address the comments made about that  
20 mitigation measure on Tuesday?

21 A Yes. I believe the comment made about  
22 the double-walled tank was the Applicant preferred  
23 not to do it because if you had a double-walled  
24 tank and there was a leak on the interior wall,  
25 that you could not visually observe any evidence

1 of leakage, or any evidence of corrosion that  
2 might lead to leakage.

3 In fact, double-walled tanks are widely  
4 used in the industry. In Mr. Radis' book,  
5 Guidelines for Post-Release Mitigation Technology  
6 in the Chemical Process Industry, there's a whole  
7 chapter on the use of them. In cases before the  
8 Commission, the High Desert Power Project has used  
9 a double-walled tank, the Pittsburgh Enron Project  
10 has used a double-walled tank, and I believe the  
11 La Paloma Project has also used a double-walled  
12 tank.

13 The issue of not being able to see the  
14 interior wall is usually dealt with by installing  
15 a detection system, or a monitoring system in the  
16 air space between the inner wall and the outer  
17 wall. It's easily dealt with.

18 HEARING OFFICER WILLIAMS: Dr. Fox, do  
19 you intend to rely on anything from Dr. Radis'  
20 book, the chapter that you mentioned; is there  
21 anything in particular in there that you are  
22 relying on one way or the other?

23 THE WITNESS: Yes. The -- the chapter  
24 on, I think, double-walled tanks is pertinent to  
25 this case.

1                   HEARING OFFICER WILLIAMS: Well,  
2       Counsel, would you have that copied and submit it  
3       --

4                   MS. REYNOLDS: Yes.

5                   HEARING OFFICER WILLIAMS: -- as an  
6       exhibit.

7                   MS. REYNOLDS: Do you want just that  
8       chapter, or do you want the whole book?

9                   HEARING OFFICER WILLIAMS: Whatever  
10      you're relying on.

11                  MS. REYNOLDS: Okay.

12                  BY MS. REYNOLDS:

13                 Q     Do you have anything more to add about  
14      double-walled tanks?

15                 A     No. The main point is that they're  
16      feasible, they're widely used, the Commission has  
17      required them in other cases, and in fact they're  
18      described in Mr. Radis' book as being technically  
19      feasible.

20                 Q     Another mitigation measure that you  
21      recommended was enclosing the tank in an  
22      enclosure, or a building, to prevent the released  
23      ammonia from spreading. Can you address comments  
24      made about that on Tuesday?

25                 A     That is also not as common as double-

1       walled tanks, but it is also a measure which is  
2       used to control releases of hazardous materials  
3       from storage tanks. There's a chapter, likewise  
4       in this same book, on that. And in fact, the  
5       British design codes for anhydrous ammonia  
6       recommend the use of enclosures. There's not  
7       really any problem with fire or dangerous levels  
8       of vapors. The enclosures are usually vented to a  
9       scrubber, and there are simple engineering fixes  
10      to deal with the issues that were raised in that  
11      testimony.

12           Q     Dr. Fox, could you for the record just  
13      read the full title and date for that book that  
14      you're citing that Mr. Radis was the author for?

15           A     Guidelines for Post-Release Mitigation  
16      Technology in the Chemical Process Industry, 1997.

17           Q     Another mitigation measure that you  
18      suggested was underground containment of part or  
19      all of the storage tank. Can you address comments  
20      made Tuesday about that mitigation measure?

21           A     Well, I believe the criticism of the  
22      underground containment measure was that in a  
23      release from an anhydrous ammonia storage tank,  
24      that the material, because it's under pressure,  
25      would flash, and you wouldn't have a vapor phase

1       that could be captured in an underground  
2       containment, and therefore it didn't make any  
3       sense.

4               As a matter of fact, the Applicant has  
5       proposed to use an above-ground containment system  
6       for their ammonia storage tank, and if it is true  
7       that the anhydrous ammonia will flash  
8       instantaneously, then the above-ground containment  
9       system would work even less well than an  
10      underground containment system. But, in fact,  
11      when you have an anhydrous ammonia leak it all  
12      does not instantaneously flash, particularly when  
13      it's a large release. Some of it certainly does  
14      flash, but some of it also becomes a liquid pool.

15             And in fact, the models that are used to  
16      model the dispersion of a release assume a certain  
17      fraction of that release as being liquid. And to  
18      the extent that an above-ground containment system  
19      would work, an underground containment system  
20      would be even superior because the amount of  
21      ammonia that's released is a function of the  
22      surface area that is exposed. And in an above-  
23      ground containment system, in order to contain the  
24      entire contents of the tank you have to have a  
25      large surface area, whereas for an underground

1       containment you could have a small opening, like  
2       ten feet on a side or five feet on the side. The  
3       liquid would fall through the hole and the only  
4       surface area that would be exposed would be the  
5       dimension of that opening.

6               So an underground containment system  
7       would be more effective than an above-ground  
8       containment system.

9               Q     Dr. Fox, can you address the activation  
10      time and -- and level for the Applicant's water  
11      deluge system?

12              A     The -- the effectiveness of a water  
13      deluge system depends on the amount of time it  
14      takes to activate. And in my testimony, I stated  
15      that number was not in the record. And in their  
16      testimony on Tuesday the Applicant said it would  
17      be essentially instantaneous, and I think Mr.  
18      Radis used as an example one minute. I'm not  
19      clear which it is, but whichever it is, the  
20      effectiveness of that system is directly tied to  
21      the amount of time it takes for it to come online.

22              And if the water deluge system is the  
23      only system that's required, I believe that the  
24      Applicant should be required to present a bona  
25      fide engineering calculation of what that time

1       would be, and it should be required as a  
2       certification condition because the functioning of  
3       that system, the control of release depends on  
4       that activation time, and -- and the record is not  
5       clear on that at this point.

6           Q     Dr. Fox, even if the activation time was  
7       -- was included as a condition of certification,  
8       would that water deluge system mitigate the -- the  
9       impacts associated with a catastrophic tank  
10      failure release scenario?

11          A     No, it wouldn't. As I explained  
12      earlier, the effectiveness is a function of the  
13      momentum of the release, and in a catastrophic  
14      release you can have significant momentum and the  
15      anhydrous ammonia would just go right through the  
16      water curtain. You'd have very, very little  
17      removal.

18          Q     I just want to address a couple more  
19      issues that came up during staff's testimony on  
20      Tuesday.

21                  Staff went through the Lees Loss  
22      Prevention Book, talking about external hazards  
23      affecting the ammonia storage tank, and they ruled  
24      out several. That's actually in the FSA on page  
25      65. They rule out earthquakes, fires and

1 explosions.

2 Do you agree with staff's assertions  
3 that these external hazards can be ruled out for  
4 the storage tank?

5 A You can never rule out an external  
6 hazard. Like, for example, I don't see how you  
7 could ever rule out an earthquake. I mean, every  
8 earthquake we have, we -- we learn some additional  
9 stuff that we need to include in our codes.

10 Q Do -- does compliance with seismic codes  
11 prevent any tank failure during an earthquake?

12 A Compliance with seismic codes would --  
13 would reduce the probability of an accident  
14 occurring, but it certainly would not eliminate  
15 the possibility of an accident.

16 Q In this Final Staff Assessment, staff  
17 rules out the possibility of fires and explosions  
18 due to the location of the natural gas line and  
19 the turbines at the facility. In your opinion,  
20 can we rule out fires and explosions as possible  
21 causes of tank failures here?

22 A I certainly wouldn't. Let me get back  
23 up here and put my figure back on.

24 Here we have again Figure 3.2-2, and if  
25 you look at this figure, this is a pipe rack from

1 the LLP gas plant.

2 Q Can you describe for the record where  
3 that's located?

4 A It's south of -- of the power plant  
5 site, a hundred meters from the ammonia storage  
6 tank. I don't know for sure what is in those  
7 pipes, but since it's a pipe rack associated with  
8 a gas plant I would expect to find flammable  
9 materials in it.

10 Another source of flammable materials  
11 would be the use of hydrogen at the plant site.  
12 Hydrogen is very flammable. In fact, last year I  
13 seem to recall a major accident at a power plant  
14 in Florida having to do with a hydrogen release.  
15 So I -- I certainly would not rule out fires and  
16 explosions.

17 Q Okay. Dr. Fox, does staff's  
18 significance standards that they articulated on  
19 Tuesday, that varied depending on how many  
20 fatalities could occur, do those significance  
21 standards treat people in rural areas differently  
22 from people in urban areas?

23 A Yes, they do.

24 Q Can you explain how?

25 A Well, if you're in a rural area the

1 population density is -- if you're in a rural  
2 area, the population density is a lot lower, and  
3 in order to have a -- in order to have, say, ten  
4 or a hundred people killed to comply with staff's  
5 new significance threshold, you'd have to have a  
6 much larger release that would have an area of  
7 concentration that is large enough to encompass  
8 that many people. So you would have to have a  
9 much greater release in a rural area to have a  
10 significant impact than in a densely populated  
11 area.

12 Q So does that mean that staff's  
13 significance standard would not find a significant  
14 impact to a rural person, where it would find a  
15 significant impact to a person who lived in an  
16 urban environment?

17 A That's exactly how it would work.

18 Q The Applicant has stated that it wants  
19 to obtain ammonia directly from the supplier. Can  
20 you identify the locations in the state from which  
21 the Applicant could obtain ammonia directly from  
22 the supplier?

23 A Directly from the supplier. My  
24 understanding is that most of the anhydrous  
25 ammonia used in California is imported through the

1 Ports of Sacramento, Stockton, and Long Beach,  
2 with the exception of ammonia that's produced in  
3 isomax units in refineries. There are several  
4 refineries that produce ammonia. I think the  
5 Tosco Refinery in the Bay Area is one. And I  
6 believe that one or more of the refineries in the  
7 South Coast produce anhydrous ammonia.

8 Q That's all I have on direct.

9 A I -- I have --

10 Q I'm sorry. Dr. Fox, do you have any  
11 additional comments?

12 A I do. I wanted to address Mr. Tyler's  
13 remarks yesterday. The Applicant presented a  
14 probability analysis for the worst case and --

15 HEARING OFFICER WILLIAMS: Dr. Fox, it's  
16 not important, but it was Tuesday, I believe.

17 THE WITNESS: Tuesday?

18 HEARING OFFICER WILLIAMS: Tuesday, the  
19 day before yesterday.

20 THE WITNESS: Thank you.

21 Mr. Tyler -- well, the Applicant  
22 presented a probability analysis for a  
23 catastrophic failure and an alternate failure of  
24 the ammonia storage tank. And Mr. Tyler took  
25 difference with the Applicant's probability

1 analysis, and thought that the Applicant had  
2 actually overestimated the probability. And on  
3 Tuesday I learned that -- why Mr. Tyler thought  
4 that.

5 Mr. Tyler used a 1980 report, a Dutch  
6 1980 report, called the Rijnmond Report --

7 BY MS. REYNOLDS:

8 Q Dr. Fox, could you clarify for the  
9 record, is this the table that Mr. Tyler referred  
10 to and read from during his testimony on Tuesday?

11 A It is, and I see the book open in front  
12 of him, so maybe I could borrow it and read from  
13 the title.

14 (Inaudible asides.)

15 THE WITNESS: The book is -- the book is  
16 Loss Prevention in the Process Industries, Hazard  
17 Identification Assessment and Control, by Frank P.  
18 Lees, and it's the second edition.

19 BY MS. REYNOLDS:

20 Q And it's Volume 3?

21 A And it is Volume 3. And I am looking at  
22 Table A8.7 in Appendix 8, page 13 of that  
23 appendix, and the title of the table that I'm  
24 going to be talking about is "The Rijnmond Report,  
25 Summary of Assessment of Ammonia Storage UKF."

1                   Mr. Tyler used this table to argue that  
2                   the Applicant's probability analysis was not  
3                   accurate, and in fact overestimated the failure.

4                   MS. LUCKHARDT: I'm feeling at a  
5                   disadvantage here, again. I don't have a copy of  
6                   that book with me, I don't have a copy of the  
7                   table. I don't know what the additional stuff is  
8                   that she has written on there. And --

9                   COMMISSIONER MOORE: Dr. Fox, let's --  
10                  in recognition of what Counsel is saying, let's  
11                  take a five-minute break, make a copy of the  
12                  table. Let's make sure that everybody's referring  
13                  to it in front of them, because Mr. Tyler did  
14                  refer to that the other day. At least that way  
15                  everyone will be on the same page as -- quite  
16                  literally.

17                  MS. REYNOLDS: We actually have a book.  
18                  We can just -- they can borrow our book. Is that  
19                  --

20                  HEARING OFFICER WILLIAMS: I need to go  
21                  back to --

22                  MS. LUCKHARDT; Okay.

23                  COMMISSIONER MOORE: Five minutes.

24                  HEARING OFFICER WILLIAMS: Off the  
25                  record.

1 (Off the record.)

2 HEARING OFFICER WILLIAMS: On the  
3 record.

4 All parties who were present at the  
5 break are again present in the hearing room. And  
6 Dr. Fox is testifying.

7 Please continue.

8 As Dr. Fox prepares to continue, I have  
9 marked as Exhibit Number 26 the Rijnmond Report,  
10 R-i-j-n-m-o-n-d, Appendix -- Rijnmond Report,  
11 Appendix 8-13.

12 (Thereupon, Exhibit 26 was marked  
13 for identification.)

14 THE WITNESS: Okay. Well, I'll continue  
15 with that, then.

16 MS. REYNOLDS: I'm sorry. Could you  
17 give me that exhibit number again?

18 HEARING OFFICER WILLIAMS: Exhibit 26.

19 COMMISSIONER MOORE: -- 26.

20 MS. REYNOLDS: Okay. And A.8-13? I  
21 just want to make sure the reference is correct.

22 COMMISSIONER MOORE: Right. That's a  
23 page from the Rijnmond Report.

24 MS. REYNOLDS: Right. I --

25 COMMISSIONER MOORE: J7?

1 MS. REYNOLDS: A8.7. Or page 8 -- 8-13.

2 HEARING OFFICER WILLIAMS: Yeah.

3 Everybody has a copy, I assume.

4 Go ahead, Dr. Fox.

5 THE WITNESS: Okay. We were going to  
6 talk about the Rijnmond Report, and as I said  
7 before, Mr. Tyler, in his written testimony on  
8 Hazardous Materials, argued that the Applicant's  
9 probability analysis was -- overstated the  
10 probability of a tank failure. And he used as the  
11 basis for that statement this table, Table A8.7,  
12 from the Rijnmond Report.

13 And --

14 HEARING OFFICER WILLIAMS: Exhibit 26.

15 THE WITNESS: Exhibit 26. And the point  
16 that I would like to make is this table is not  
17 representative of the accident scenarios that the  
18 Applicant analyzed. The probability of an  
19 accident depends on the amount of material that's  
20 released. If you release large amounts of  
21 material in a catastrophic fashion, the  
22 probability is a lot lower than if you have a  
23 small leak and stuff dribbles out over time. And  
24 this table from the Rijnmond Report is basically  
25 for catastrophic releases of large amounts of

1 stuff, and it's not comparable at all to the  
2 scenario that the Applicant analyzed.

3 For example, the Applicant's worst case  
4 tank scenario, which was the catastrophic failure,  
5 had a probability associated with it of 3.72 times  
6 ten to the minus five, or four chances out of a  
7 hundred thousand, down at the bottom of the figure  
8 before you. And the comparable catastrophic  
9 release scenarios from this table are what's  
10 labeled U0 and U1 in the left-hand column. The  
11 first one, U0, is a catastrophic failure of a  
12 sphere when full. And that release has a  
13 probability associated with it of 2.3 times ten to  
14 the minus seven, which is about two orders of  
15 magnitude smaller than the number the Applicant  
16 found.

17 But if you go over here and you look in  
18 the column on -- on mass and duration of the  
19 release, you will find that the scenario U0 was a  
20 catastrophic instantaneous release of 682,000  
21 kilograms of ammonia.

22 BY MS. REYNOLDS:

23 Q Dr. Fox, could you put that in gallons,  
24 or some kind of measurement that we can  
25 understand?

1           A     I'm not sure I can do that off the top  
2     of my head.

3           COMMISSIONER MOORE:   Well basically, Dr.  
4     Fox, you just indicated that the entire tank  
5     evacuated instantaneously.

6           THE WITNESS:   Right.  Alternatively, the  
7     Applicant's worst case catastrophic scenario was a  
8     release of the contents of a 10,000 gallon tank  
9     over a ten minute period, which, assuming a two-  
10    inch hole is equal to about 41 kilograms per  
11    second over ten minutes, which amounts to about  
12    24,000 kilograms over that period.  So if you  
13    compare the 24,000 kilograms to the amount of  
14    material involved in these catastrophic failures  
15    here, you will see that the Rijnmond Report was  
16    reporting probabilities for a truly large  
17    catastrophic failure.  It's not comparable to the  
18    situation that the Applicant was analyzing.

19           And similarly, in the case of the  
20    alternate tank failure, which was, as you recall,  
21    the pipe or the valve, this is another copy of the  
22    Rijnmond table, the same table, Table A8.7, but  
23    this one now focuses on the alternate scenario.  
24    And the Applicant found a probability of the  
25    alternate scenario of 2.43 times ten to the minus

1 three events per year. And the scenario that they  
2 analyzed was a release of 5.4 kilograms per second  
3 over 30 minutes, or 9,720 kilograms over that  
4 release period.

5 And the only things on this table that  
6 are comparable, in other words, a pipe or a valve,  
7 there's no valves on this table. The only things  
8 that are on this table are pipes. If you look at  
9 some of the pipe scenarios, like U2.1, which has a  
10 much lower probability than the one the Applicant  
11 had, is 5.6 times ten to the minus seven, which is  
12 about two orders of magnitude smaller than the  
13 number that the Applicant used, what you see when  
14 you go over here to the mass flow column and the  
15 duration column, is that that was for a release of  
16 166 kilograms per second, compared to the  
17 Applicant's 5.4, and it was for a duration of 1200  
18 seconds, which is 20 minutes, or a total of  
19 199,200 kilograms of material compared to the  
20 Applicant's scenario of 9,720.

21 But you could also look at U2.3 or U2.4,  
22 and you reach the same conclusion. I won't bore  
23 you with the details.

24 The point is, is that the probabilities  
25 in the 1982 Rijnmond Report are for very large

1 releases, and they're not comparable to the  
2 releases that are being analyzed in this case.

3 And then I'd like to slip back to the  
4 probability discussion earlier. Counsel cut me  
5 off before I got all the way through my  
6 discussion.

7 But the previous discussion --

8 HEARING OFFICER WILLIAMS: Dr. Fox,  
9 Counsel, would you also provide, and we'll mark it  
10 as 26 -- 26-A, would be the second exemplar that  
11 Dr. Fox used for the pipe scenario. Same exhibit,  
12 but she had different markings on it.

13 (Thereupon, Exhibit 26-A was marked  
14 for identification.)

15 THE WITNESS: In my earlier discussion  
16 of probabilities using the Applicant's analysis, I  
17 was focusing on the two catastrophic tank  
18 scenarios which have lower probabilities than a  
19 third scenario that the Applicant analyzed. The  
20 Applicant also analyzed what they call a more  
21 likely case scenario, which has a probability of  
22 1.6 times ten to the minus two per year, which is  
23 an occurrence of once every 64 years.

24 And if you take a look at that, you will  
25 see that you can reach a concentration of 2,000

1 ppm in the case where the deluge system doesn't  
2 work up to 235 meters from the tank, and a  
3 concentration of 75 ppm, which is the significant  
4 irritation threshold, almost 4,000 meters from the  
5 tank.

6 And if you put those numbers on the same  
7 figure of the plant site Figure 3.2-2, which we  
8 were talking about earlier, you can see that the  
9 2,000 ppm contour would encompass much of the LOAP  
10 gas plant on the southern boundary of the  
11 facility. It would also encompass wells on the  
12 corners, the tank storage facility to the north,  
13 and a portion of Elk Hills Road. This is the most  
14 likely scenario, with a 47 percent chance of  
15 occurring over the lifetime of the facility.

16 The 1,000 ppm isocontour would encompass  
17 all of the receptors that we've been talking  
18 about, including a big chunk of Elk Hills Road.

19 MS. LUCKHARDT; You know, I -- you know,  
20 I really feel at a huge disadvantage here. She's  
21 bringing up new exhibit after new exhibit after  
22 new exhibit that I have not seen until right now.  
23 Now we have another -- another graph, another  
24 table. We have two more pages of documents that,  
25 you know, Counsel, you know, I haven't seen until

1 right now.

2 COMMISSIONER MOORE: Well --

3 MS. REYNOLDS: This --

4 MS. LUCKHARDT: And I -- I don't have a  
5 chance to check it, I'm -- you know, we're  
6 scrambling among my witnesses to try and figure  
7 out whether it's accurate or correct or right, and  
8 --

9 MS. REYNOLDS: I can --

10 MS. LUCKHARDT: -- and to look at the  
11 material as she's talking about it --

12 COMMISSIONER MOORE: All right. Well,  
13 let's -- let's go back, taking that comment under  
14 advisement let's go back one graph. What's the  
15 one that you just showed before this?

16 THE WITNESS: The one that I just showed  
17 before is Figure 3.2-2, out of the AFC.

18 COMMISSIONER MOORE: And is that the one  
19 that we talked about before --

20 (Parties speaking simultaneously.)

21 MS. LUCKHARDT: No, it's a different  
22 one.

23 MS. REYNOLDS: No. The --

24 COMMISSIONER MOORE: -- so now, once  
25 again, you --

1 MS. REYNOLDS: This -- the Applicant  
2 analyzed --

3 MS. LUCKHARDT: Why couldn't this have  
4 been provided earlier? I don't think this is any  
5 information that is brand-new.

6 MS. REYNOLDS: This information -- this  
7 is simply a depiction of what the Applicant did.  
8 All this does is graphically -- or take a figure  
9 from the AFC and put the Applicant's consequence  
10 analysis --

11 COMMISSIONER MOORE: You took a table  
12 from the AFC.

13 MS. REYNOLDS: Yes.

14 MS. LUCKHARDT: They did.

15 MS. REYNOLDS: A table from the -- a  
16 figure from the AFC. And a table from the data  
17 request responses, and simply plotted that.

18 MS. LUCKHARDT: You know, there's no  
19 reason, though, that this information couldn't  
20 have been provided in advance of today.

21 MS. REYNOLDS: It's the same information  
22 --

23 MS. LUCKHARDT: We haven't had a chance  
24 to check it. I can't tell you whether these  
25 numbers are right and whether the distances are

1 correct.

2 COMMISSIONER MOORE: Dr. Fox, how many  
3 of these drawings do you have?

4 THE WITNESS: This is the last one. The  
5 only other thing I'm going to put up here, which I  
6 just had up here, is Table 2 out of the  
7 Applicant's response to Data Request 9.

8 COMMISSIONER MOORE: Make a copy of the  
9 -- of the last map. Let me -- let me just say a  
10 couple of things before --

11 MS. REYNOLDS: They -- I --

12 COMMISSIONER MOORE: We're going to --  
13 hang on. We're going to take a lunch break.  
14 We're going to be back here at 1:00 o'clock. Make  
15 a copy of the maps, anything else where you've  
16 interpreted things. And let's -- let's make a  
17 couple things clear, just before we get too much  
18 farther with this.

19 I will not entertain a motion where  
20 someone has a set of tables in front of them that  
21 they should have read, that their experts, not  
22 Counsel, but experts should have read and should  
23 have digested. If the experts haven't done that  
24 and can't instantly respond to Counsel when they  
25 have a query of that, then they're not the experts

1       you should have on your team. That's one.

2               Two. From now on, where there is an  
3       interpretation that is made, I want everybody to  
4       have a copy of it before anybody stands up here.  
5       If you're going to bring something up and you have  
6       a drawing, or you've interpreted data that's --  
7       that's otherwise already represented, it is only  
8       fair that everyone have the exact same thing in  
9       front of them that goes up on the board, and that  
10      they've had a chance to look at it. That's --  
11      we're going to have to level this playing field.

12             And in a more sweeping statement,  
13      because we're going down a set of roads here that  
14      I -- I find intriguing, but you can imagine the  
15      policy implications of doing this, when this case  
16      comes to a close, when any of the other cases that  
17      I might be involved in that you might or might not  
18      know about come to a close, I will not be  
19      reinventing standards that the Energy Commission  
20      will have to interpret on behalf of other  
21      agencies. It's not going to happen.

22             I'm intrigued with the idea that some of  
23      those standards may not be the right ones. But if  
24      the ARB has a standard that my staff or the  
25      Applicant or CURE is relying on, you know --

1       actually, that my staff, that my Commission is  
2       relying on, that's what we're going to rely on.

3               Do not look to me to make a judgment  
4       call that reinterprets an existing standard,  
5       because we'll go down a long argument phase. You  
6       may convince me as a human that it's the right  
7       thing to do, but as a Commissioner I'm not going  
8       to take my Commission there. Because they're not  
9       -- they're not ready to go there. We're not going  
10      to reinvent stuff for other agencies.

11             So let's just -- I should've made that  
12      clear at the very outset of the hearing, although  
13      I wasn't presiding at that time. I am now, and I  
14      won't be reinventing those standards.

15             Where you think that Applicant,  
16      Intervenors, or staff have misinterpreted a  
17      standard, misused a statistic, or misapplied a --  
18      a datapoint, fair game. Fair game, and you can  
19      show your own calculations. But I think to be  
20      fair to everyone, God, especially where there's  
21      something where Phyllis can do this in her head  
22      and -- write the -- write the formula out. Let's  
23      put everybody else on the same page. I mean,  
24      especially where -- where the statistics are  
25      involved. And it's only fair. I mean, we -- we

1       need to all be playing on a -- on a level playing  
2       ground.

3               We'll take an hour and ten minute break.  
4       You can make a copy of that, Phyllis, or our staff  
5       will do that for you.   and --

6               THE WITNESS:   We've already copied this,  
7       and they already have it.

8               COMMISSIONER MOORE:   And then we'll come  
9       back in and we'll all be talking on the same page,  
10      and then we'll proceed.

11              Thank you.   We're in recess.

12              HEARING OFFICER WILLIAMS:   Let's go off  
13      the record.

14              (Thereupon, the luncheon recess was  
15      taken.)

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1                               AFTERNOON SESSION

2                               HEARING OFFICER WILLIAMS: I'll just  
3                               state for the record that all parties who were  
4                               present before the break are again -- before the  
5                               lunch break, are again present in the hearing  
6                               room, and we are prepared to proceed.

7                               DIRECT EXAMINATION (Resumed)

8                               BY MS. REYNOLDS:

9                               Q     Dr. Fox, I believe you have one more  
10                              overhead you wanted to discuss, and I don't think  
11                              -- there are no changes to this. It's directly  
12                              out of a data request response by the Applicant.

13                             MS. LUCKHARDT: I would like to request  
14                             at this time that Dr. Fox stand outside of the  
15                             center of the area.

16                             COMMISSIONER MOORE: Outside of the --  
17                             I'm sorry.

18                             MS. LUCKHARDT: The center area, so that  
19                             I have the benefit of seeing her facial  
20                             expressions, which I cannot see sitting back here.

21                             MS. REYNOLDS: I think she can do that  
22                             for this --

23                             COMMISSIONER MOORE: Okay, that's fine.  
24                             I mean, that's --

25                             MS. LUCKHARDT: Communication is -- is

1       formed in a lot of different ways, and I am losing  
2       all of that from the angle that I'm sitting at.

3               COMMISSIONER MOORE:  You're trying to  
4       translate from the look on my face to --

5               (Laughter.)

6               COMMISSIONER MOORE:  Dr. Fox, if you'll  
7       -- if you would observe that, if you can just put  
8       your overhead up and then talk from behind the  
9       desk.

10              MS. REYNOLDS:  Can you point from there?

11              COMMISSIONER MOORE:  Can you?

12              THE WITNESS:  No.

13              (Inaudible asides.)

14              MS. REYNOLDS:  She wants to see your  
15       face.

16              THE WITNESS:  Is there a mic that would  
17       reach over here?

18              MS. REYNOLDS:  Oh, I think so.

19              THE WITNESS:  And --

20              COMMISSIONER MOORE:  Is this --

21              MS. REYNOLDS:  I think if you -- if you  
22       stand right there you'll be fine.  It's no  
23       different than what you would be if you were  
24       sitting, so --

25              THE WITNESS:  But I may kill myself

1 standing right here. It's booby-trapped.

2 Okay. The last overhead -- does this  
3 have an exhibit number?

4 BY MS. REYNOLDS:

5 Q That is already in one of -- that's  
6 attached to your testimony as an exhibit, in I.

7 A Okay. On --

8 HEARING OFFICER WILLIAMS: It's Exhibit  
9 I to Dr. Fox's testimony. And for the record, Dr.  
10 Fox's testimony has been marked as Exhibit 30 for  
11 identification.

12 (Thereupon, Exhibit 30 was marked  
13 for identification.)

14 MS. REYNOLDS: That is Table 2 to the  
15 Applicant's response to staff Data Request 9, I  
16 believe.

17 HEARING OFFICER WILLIAMS: A similar  
18 chart is -- without -- with markings, is also in  
19 the record separately as Exhibit 29.

20 THE WITNESS: I think I already talked  
21 about the top half of this figure before the lunch  
22 break, and I just wanted to make a few remarks  
23 about the bottom half of this figure. The bottom  
24 half of this table is labeled Table 2, Summary of  
25 Maximum Ammonia Concentrations at Sensitive

1       Receptors. And it lists the maximum ammonia  
2       concentration for all of the scenarios that the  
3       Applicant analyzed with and without the water  
4       deluge system at two locations, at Elk Hills Road,  
5       and if you'll recall, Elk Hills Road is about 700  
6       feet at its closest point from the ammonia storage  
7       tank, and also at the Elk Hills Operation Office,  
8       which was not shown on the figures that I  
9       presented earlier because I couldn't find anything  
10      in the AFC that showed where it is. But the Elk  
11      Hills Operation Office is on the east side of Elk  
12      Hills Road, basically.

13               What this table shows is that the worst  
14      case concentrations that would be reached on Elk  
15      Hills Road in the worst case unmitigated would be  
16      28,635 ppm of ammonia, which exceeds the highest  
17      ammonia significance threshold of 2,000 ppm, which  
18      is the lethality level, by a factor of ten. And  
19      the worst case mitigated is 22,530, which again  
20      exceeds the worst case lethality level by a factor  
21      of ten.

22               The 2,000 ppm lethality level that staff  
23      relies on is, I believe, a 30 minute concentration  
24      average. And one could argue that in 30 minutes,  
25      motorists on Elk Hills Road would pass through the

1 plume and wouldn't be affected, so one then would  
2 not need to worry about these high concentrations.

3 However, it is very easy to convert a  
4 2,000 ppm ammonia concentration averaged over 30  
5 minutes to another concentration which would be  
6 averaged over one second. There's a relationship  
7 that's used in toxicology called Haber's Law,  
8 which expresses the concentration rates to an  
9 exponent times a time factor is equal to a  
10 constant. And you can use that relationship to  
11 convert, say, a 2,000 ppm concentration over 30  
12 minutes into another concentration for a different  
13 averaging time.

14 And if you make that calculation with  
15 the 2,000 ppm concentration, but very  
16 conservatively assume that it's averaged over one  
17 hour instead of the 30 minutes that staff uses,  
18 you get a one second lethality concentration for  
19 ammonia of 10,700 ppm. In other words, if someone  
20 is exposed to 10,000 ppm of ammonia in one second,  
21 they have the potential of dying from that  
22 exposure.

23 And if you then evaluate this 28,635 and  
24 22,530 with respect to Elk Hills Road, and you  
25 realize that motorists are passing through there

1 at about 70 feet a second, you could have a  
2 significant number of motorists that would receive  
3 this large dose in a one second period of time, so  
4 you could actually have fatalities in the worst  
5 case unmitigated and the mitigated cases both.

6 BY MS. REYNOLDS:

7 Q Okay. Dr. Fox, we talked briefly  
8 earlier about the water deluge system and how  
9 quickly it would trigger. The deluge system is  
10 also -- the Applicant has stated it would be  
11 triggered at a level of 75 ppm. Can you comment  
12 on that?

13 A I think that's too high. By the time  
14 you reach 75 ppm, you could've already reached a  
15 situation that could not be easily controlled by  
16 the water deluge system. I think the trigger  
17 concentration should be a lot lower. I personally  
18 would recommend one ppm, which is within -- in the  
19 range of commonly available ammonia detectors.

20 Q Another mitigation measure that you  
21 recommended was the use of aqueous ammonia rather  
22 than anhydrous. Can you comment on that? That  
23 was -- the Applicant and staff had some rebuttal  
24 to that on Tuesday.

25 A Right. I believe the comment that we

1 heard on Tuesday was that aqueous ammonia would  
2 increase the number of tanker truck deliveries of  
3 aqueous ammonia to the site by a factor of five,  
4 compared to the use of anhydrous ammonia. And I  
5 agree with that. That's correct, you would indeed  
6 increase the number of deliveries if you used  
7 aqueous ammonia instead of anhydrous.

8           However, the reason that many public  
9 agencies choose to require aqueous ammonia is  
10 because the consequences are significantly less  
11 than with anhydrous ammonia. Anhydrous ammonia  
12 flashes very quickly, and it's stored under  
13 pressure, and the consequences of the spread and  
14 the concentrations that you find in the plume are  
15 much higher than for a similar release of aqueous  
16 ammonia. And as a result, public agencies charged  
17 with protecting public health commonly, in  
18 California, and particularly in the last decade,  
19 require the use of aqueous ammonia.

20           In recent siting cases before the  
21 Commission, the High Desert Power Project has  
22 chosen to use aqueous ammonia. Three Mountain  
23 Power up in Shasta County is proposing to use  
24 aqueous ammonia. I believe the Pittsburg Enron  
25 Project uses aqueous ammonia. The La Paloma

1 Project, also in Kern County and quite close to  
2 this one, will be using aqueous ammonia.

3 The use of aqueous ammonia is actually  
4 quite common. And in the attachments to my  
5 Hazardous Materials testimony I include excerpts  
6 from a number of EIRs that were done mainly in the  
7 South Coast, where in the case of the Redondo  
8 Generating Station, the South Coast Air Quality  
9 Management District actually evaluated both  
10 aqueous and anhydrous ammonia, and imposed a  
11 condition to use aqueous ammonia because the  
12 consequences were quite a bit less significant  
13 than anhydrous ammonia.

14 Q Dr. Fox, there's been a lot of talk  
15 about significance standards Tuesday and today.  
16 In your opinion, what is a significant impact -- I  
17 think first of all we should discuss in parts per  
18 million exposure?

19 A Yeah. There's two pieces to the  
20 significance standard that is used here. One of  
21 them is the exposure concentration, and the other  
22 one is the probability.

23 Mr. Tyler uses as a lower level exposure  
24 concentration 75 ppm over a 30 minute average. I  
25 personally believe that is high, and the reason I

1 believe that is, first -- I'm almost hesitant to  
2 raise occupational exposure standards in this  
3 forum, but there is an occupational exposure  
4 standard for workers called the STEL, which  
5 establishes a limit of 35 ppm, half of what Mr.  
6 Tyler uses, on a -- based on a 15 minute average.  
7 Additionally, OEHHA, the Office of Environmental  
8 Health Hazard Assessment, has established an acute  
9 REL for ammonia of 3.5 ppm.

10 I believe 75 ppm is too high, and I -- I  
11 would advocate something lower than that.

12 Q What is your opinion, in summary, about  
13 the use of probability of an accident in defining  
14 a significance standard, or a significant impact?

15 A I believe for a public agency concerned  
16 with protecting public health, that probability  
17 should not be considered. And the reason I  
18 believe that is because accidents happen. I mean,  
19 you can have a accident that is very unlikely,  
20 like an accident with a chance of less than one in  
21 a million, and it can happen. And the  
22 consequences can be very severe. On the other  
23 hand, you can have an accident that's very likely,  
24 one chance in, say, a thousand. And it may not  
25 happen over the 30 years of the project.

1           That's the nature of probability. The  
2       -- the cold facts of the matter are that accidents  
3       happen. And the two regulatory agencies that have  
4       authority over the RMP process, the EPA and CalArp  
5       in California, don't entertain the use of  
6       probabilities in determining the consequences. It  
7       -- it obscures where you want to go. I mean,  
8       where you want to go in a consequence analysis is  
9       you want to look and see what the worst case  
10      consequences could be. You want to see who you  
11      could affect, and what that effect could be. And  
12      once you know that, then you want to figure out  
13      ways to mitigate that impact so when the accident  
14      happens you're protected. That's the reason that  
15      I personally would not consider probability in  
16      this kind of forum.

17           Q     Dr. Fox, can you address the issue of  
18      offsite versus onsite workers that was discussed  
19      by both the Applicant and staff on Tuesday?

20           A     Yes. Again, EPA and CalArp, in their  
21      RMP program, don't make a distinction between  
22      offsite workers and other members of the public.  
23      Those programs require that you draw a circle  
24      around -- say in this case, the ammonia tank, you  
25      draw a circle around the source that could cause

1 the accident, and you look everywhere within the  
2 360 degrees of that circle. You don't isolate out  
3 a particular segment. You look 360 degrees  
4 around. You don't separate out offsite workers  
5 from other members of the public.

6 And furthermore, in this case it doesn't  
7 really make any difference, because the  
8 occupational exposure standard, if you were to  
9 apply one here, is lower than staff's 75 ppm  
10 significance level. The occupational exposure  
11 level for ammonia is 35 ppm, based on a 15 minute  
12 average. So even if you applied occupational  
13 standards and separated out the offsite workers,  
14 you still reach the same conclusions.

15 Q Dr. Fox, there were a lot of different  
16 scenarios studied by the Applicant. There was a  
17 worst case, which was the catastrophic tank  
18 failure, there was an alternate case, which was a  
19 valve or pipe failure, and then there was a most  
20 likely case. For each of those three scenarios,  
21 what is your assessment regarding the  
22 significance, or lack thereof, of the impacts  
23 associated with those scenarios?

24 A I think all three of those scenarios are  
25 significant.

1           Q     Could you give a brief wrap-up of your  
2     testimony, a big picture?

3           A     Big picture. No matter how you cut it,  
4     there would be significant impacts if you had a  
5     failure of the ammonia storage tank or its piping  
6     and associated valves. And as the certification  
7     conditions are currently drafted, there is no  
8     mitigation required for any of those impacts.

9           MS. REYNOLDS: Thank you. That's it.  
10    That's all.

11           HEARING OFFICER WILLIAMS: Counsel, do  
12    you want to introduce those documents at this  
13    time?

14           MS. REYNOLDS: Yes. At this time -- Dr.  
15    Fox's Hazardous Materials Management and Traffic  
16    and Transportation Impacts testimony, since they  
17    both deal with ammonia, are together. So would  
18    you like me to wait until we have finished Traffic  
19    and Transportation, or would you like me to enter  
20    it now?

21           HEARING OFFICER WILLIAMS: Let's try to  
22    do it now.

23           MS. REYNOLDS: Okay. I would like to  
24    move at this time to enter into the record the  
25    testimony of J. Phyllis Fox, Ph.D., on Hazardous

1 Materials Management and Traffic and  
2 Transportation Impacts. I believe that was  
3 Exhibit 25.

4 HEARING OFFICER WILLIAMS: Oh, 30.

5 MS. REYNOLDS: All right.

6 HEARING OFFICER WILLIAMS: We marked it  
7 for identification as 30.

8 MS. REYNOLDS: Okay. I'm sorry, I had

9 --

10 HEARING OFFICER WILLIAMS: Public Health  
11 is 25.

12 MS. REYNOLDS: Okay. Thank you.  
13 Exhibit 30, then.

14 HEARING OFFICER WILLIAMS: Any  
15 objections?

16 MS. LUCKHARDT: No.

17 MS. WILLIS: None.

18 HEARING OFFICER WILLIAMS: So admitted.

19 (Thereupon, Exhibit 30 was received  
20 into evidence.)

21 MS. REYNOLDS: Did you want these in the  
22 record?

23 HEARING OFFICER WILLIAMS: Yes, let's --  
24 let's go through them.

25 MS. REYNOLDS: At this time, I would

1       also like to enter into the record the exhibits,  
2       or the materials Dr. Fox used in her presentation.  
3       Those would be Exhibits 26, 26A, 27, 27A, 27B, 28,  
4       and 29.

5               HEARING OFFICER WILLIAMS: We've gone  
6       over what these documents are, but for the record,  
7       26 is the Rijnmond Report with Dr. Fox's marking  
8       about one inch above the line, which is about one-  
9       third up the page.

10              Exhibit 26A would be the same document,  
11       rather than 3.72, there's Dr. Fox's notation of  
12       2.43 times ten to the minus third/year.

13              27 is Figure 3.3-2, in the AFC, with Dr.  
14       Fox's markings thereon.

15              27A -- well, let me go back to 27 -- 27,  
16       about midway -- bottom portion of the page says  
17       Figure 650. That will be 27.

18              27A is the same document, which has Dr.  
19       Fox's designation of controlled alternative at the  
20       top of the page. That will be 27A.

21              27B again is the same document, with --  
22       that Dr. Fox has designated at the top of the  
23       page, uncontrolled most likely, and under that  
24       will be 47 percent.

25              28 would be Figure 1, worst case

1 scenario. It's also contained in Appendix I to  
2 Dr. Fox's testimony. It has a written designation  
3 of 3.72 times ten to the minus five at the top of  
4 the page.

5 29 would be -- it's also contained in  
6 Appendix I to Dr. Fox's testimony, but it has her  
7 markings on it, and it has a designation, 10,500  
8 meters, school; 8,200 meters residential on the  
9 right-hand portion.

10 And again, Exhibit 30 would be Dr. Fox's  
11 complete testimony on Hazardous Materials  
12 Management and Transportation -- Traffic and  
13 Transportation testimony.

14 Any objections to the admission of these  
15 documents?

16 MS. LUCKHARDT: No objections. I object  
17 to the timing of them.

18 HEARING OFFICER WILLIAMS: So noted.

19 These will be admitted.

20 (Thereupon, Exhibits 26, 26A, 27, 27A,  
21 27B, 28, 29 and 30 were received into  
22 evidence.)

23 HEARING OFFICER WILLIAMS: Does that  
24 complete your presentation, Counsel?

25 MS. REYNOLDS: Yes.

1                   HEARING OFFICER WILLIAMS: Cross  
2 examination?

3                   MS. LUCKHARDT: Okay. At this time,  
4 since you don't have a mic, do you want to --

5                   MR. MILLER: We would like to request a  
6 slight change of the order. As I communicated  
7 earlier, we have a witness here in the room today  
8 to deal with Waste Management, portion of that,  
9 and you may recall that when we began the  
10 proceedings we discussed segregating the soil  
11 excavation issues into one panel which would be  
12 under Worker Safety. We have some non-  
13 controversial non-hazardous waste issues that are  
14 in the AFC and that are in our testimony. We  
15 simply need to get those into the record. I don't  
16 believe that's a contested item.

17                   Part of that was to sponsor formally  
18 into the record the Phase 1 Site Assessment,  
19 Vernal Site Assessment of the property. Our  
20 witness to do that is Mr. Harry Tow, who's with us  
21 today. Because of some medical concerns, we would  
22 request your indulgence to allow Mr. Tow and brief  
23 preceding testimony by our witness, Mr. Cronk, to  
24 introduce the Waste Management portion of the  
25 case, and then get right back to the cross

1 examination on Hazardous Materials.

2 I don't believe this will take a very  
3 long time, unless I'm mistaken. So that would be  
4 my request, if -- to make at this point.

5 HEARING OFFICER WILLIAMS: Is there any  
6 objection to -- to that, Counsel?

7 MS. REYNOLDS: No.

8 MS. WILLIS: No.

9 HEARING OFFICER WILLIAMS: We'll  
10 proceed, then.

11 MR. MILLER: You'll have to give us just  
12 a moment to shuffle the chairs and get the right  
13 people in.

14 (Pause.)

15 MR. MILLER: Okay, we're ready to  
16 proceed.

17 HEARING OFFICER WILLIAMS: Proceed.

18 MR. MILLER: Does this mic not -- I know  
19 my voice is not Demosthenes, but I don't think  
20 it's that bad.

21 Can you hear me now? Okay.

22 HEARING OFFICER WILLIAMS: Excuse me.

23 Would you swear the witness, please.

24 (Thereupon, Harry Tow was, by the  
25 reporter, sworn to tell the truth,

1                   the whole truth, and nothing but  
2                   the truth.)

3                   MR. TOW: I do.

4                   MR. MILLER: I would like to bring on  
5                   first Mr. Gary Cronk to generally sponsor the  
6                   Waste Management section. Mr. Cronk has been  
7                   previously sworn, I believe.

8                   TESTIMONY OF

9                   GARY CRONK

10                  called as a witness on behalf of the Applicant,  
11                  having previously been duly sworn, was examined  
12                  and testified further as follows:

13                  DIRECT EXAMINATION

14                  BY MR. MILLER:

15                  Q     Gary, could you please restate your name  
16                  and occupation for the record?

17                  A     I am Gary Cronk. I'm an environmental  
18                  engineer with Foster Wheeler Environmental.

19                  Q     Okay. We will not repeat his  
20                  qualifications for this purpose, which have  
21                  already been introduced previously.

22                  Could you please explain the purpose of  
23                  your testimony?

24                  A     I am sponsoring the AFC section 5.13,  
25                  Waste Management, Sections 5, 6.5.12, and 6.5.13,

1 Waste Management LORS.

2 Q Do you have any corrections to make to  
3 the portion of the exhibits that you're  
4 sponsoring?

5 A No, I do not.

6 Q And are you sponsoring further testimony  
7 in this proceeding? That is to say, Attachment A  
8 to your pre-filed testimony?

9 A Yes, I am.

10 Q And that would be the document entitled  
11 Attachment A, Testimony of Gary Cronk regarding  
12 Waste Management in support of the Application for  
13 Certification for the Elk Hills Power Project.

14 A That's correct.

15 Q And do you adopt this testimony included  
16 in the document I just described, and those  
17 portions of the exhibits identified previously as  
18 your true and sworn testimony in this proceeding?

19 A Yes, I do.

20 MR. MILLER: Thank you.

21 MS. REYNOLDS: Can I interject for just  
22 a moment? I thought, Mr. Miller, I thought you  
23 said you were going to cover the non-controversial  
24 issues, but I know that Mr. Cronk's testimony  
25 covers waste detection and things like that. I'm

1       curious as to --

2               MR. MILLER:  And I excluded in his  
3       presentation just now those sections of his  
4       written declaration that dealt with that.

5               MS. REYNOLDS:  Okay.  So --

6               MR. MILLER:  And that was my intention,  
7       was to certainly allow for that to be dealt with  
8       under the Worker Safety.

9               MS. REYNOLDS:  So we will --

10              MR. MILLER:  And you will be -- we will  
11       -- I would not object to --

12              MS. REYNOLDS:  Okay, so we will deal  
13       with that later.  Okay.  I just wanted to make  
14       sure --

15              MR. MILLER:  That's fine.

16              MS. REYNOLDS:  And could I make a  
17       request that you speak up just a bit?  We're  
18       having trouble hearing.

19              MR. MILLER:  I'm doing -- I'm really  
20       trying to project here.

21              MS. REYNOLDS:  I'm sorry.

22              MR. MILLER:  And I will do my best.

23              That concludes testimony for Mr. Cronk.

24       Now I'd like to introduce Mr. Harry Tow.

25       ///

1 TESTIMONY OF

2 HARRY TOW

3 called as a witness on behalf of the Applicant,  
4 having first been duly sworn, was examined and  
5 testified as follows:

6 DIRECT EXAMINATION

7 BY MR. MILLER:

8 Q Mr. Tow, could you state your name and  
9 occupation for the record, please?

10 A My name is Harry Tow. I'm a consulting  
11 engineer for Quad Knopf, Incorporated.

12 Q And could you describe your educational  
13 background and occupational experience related to  
14 your testimony in this proceeding?

15 A I'm a principal engineer for Quad Knopf.  
16 I have project responsibility for assignments in  
17 civil engineering, economics, financial analysis,  
18 environmental studies, and capital improvement  
19 financing. The firm itself provides professional  
20 engineering, water management and environmental  
21 services, primarily in the Central Valley, both to  
22 public agency and private clients.

23 I hope Bachelor's and Master's degrees  
24 in civil engineering from the University of  
25 Southern California. Prior to forming Quad Knopf

1 in 1972, I was a founding partner, I had about 25  
2 years experience as a municipal public works  
3 director and city engineer and city manager.

4 I'm a registered environmental assessor,  
5 registered professional engineer. My clients  
6 include Kern County Department of Health, City of  
7 Bakersfield, Kern County Council of Governments,  
8 and I have prepared or participated in the  
9 preparation of about 75 environmental impact  
10 reports.

11 Q And how large is your firm?

12 A Approximately 90 people. We have four  
13 offices in the valley.

14 Q Could you please describe your  
15 experience regarding environmental site  
16 assessments?

17 A I've undertaken Phase 1 environmental  
18 site assessments since the initiation of the  
19 California REA program, and I'm familiar with  
20 CERCLA, SARA, RCRA, and with the hazardous waste  
21 regulations and concerns I have, with respect to  
22 the oil industry, evaluated oil sump drainage  
23 impacts, bulk oil storage impacts, oilfield  
24 groundwater impacts, and oilfield impacts to  
25 surface water quality. I've been employed by

1 Chevron Land, by Mobil Oil, and by industry  
2 insurers in that capacity.

3 Q Thank you. Did you perform an  
4 environmental site assessment for the site of the  
5 proposed Elk Hills Power Project?

6 A I did.

7 Q And are you sponsoring any portions of  
8 the Application for Certification for the Elk  
9 Hills Power Project, Exhibit 1?

10 A Yes. In addition to this written  
11 testimony I'm sponsoring Appendix H, Phase 1,  
12 Environmental Site Assessment.

13 Q And are you sponsoring any portions of  
14 any other exhibits?

15 A No.

16 Q Do you have any corrections to make to  
17 the exhibit that you are sponsoring?

18 A No.

19 Q Have you reviewed the California Energy  
20 Commission's staff testimony concerning Waste  
21 Management in the Final Staff Assessment, in  
22 particular the discussion of the project site and  
23 description on pages 79 and 80 of that testimony?

24 A I have.

25 Q And do you believe the referenced

1       portion of the Final Staff Assessment accurately  
2       summarizes the scope, practices employed, and  
3       primary results of your Environmental Site  
4       Assessment of the Elk Hills Power Project site?

5           A     Yes, I do.

6           Q     Thank you. I'd like to ask you a few  
7       follow-up questions on how your Phase 1 site  
8       assessment was prepared.

9                    Could you please describe the guidelines  
10      that you follow when you conduct a Phase 1 site  
11      assessment?

12          A     Well, the guidelines that we followed  
13      are the ASTM 15 -- E1527 97 standards, which are  
14      generally accepted.

15          Q     Thank you. And what is the stated goal  
16      of the Environmental Site Assessment in accordance  
17      with those standards.

18          A     To identify any recognized environmental  
19      conditions.

20          Q     And does that term have a definition as  
21      set forth in the ASTM standards?

22          A     It does, and I quoted that in the Phase  
23      1. I'd like to quote it accurately here, if I  
24      might, by reading it.

25                   The standards state that the term means

1 the presence or likely presence of any hazardous  
2 substances or petroleum products on a property  
3 under conditions that indicate an existing  
4 release, a past release, or a material threat of a  
5 release of any hazardous substances or petroleum  
6 products into structures on the property, or into  
7 the ground, groundwater or surface water on the  
8 property.

9 Q And are there any exceptions or  
10 exclusions from this definition?

11 A Yes. The standards, once again quoting  
12 them, provide this exclusion. The term is not  
13 intended to include de minimus conditions that  
14 generally do not present a material risk of harm  
15 to public health or the environment, and that  
16 generally would not be the subject of an  
17 enforcement action if brought to the attention of  
18 appropriate governmental agencies.

19 Q Thank you. And do the standards provide  
20 for some discretion and judgment to be exercised  
21 despite the specificity of the standards that  
22 guide the site assessment?

23 A They do.

24 Q And could you just briefly walk us  
25 through how a Phase 1 site assessment is normally

1 conducted pursuant to the ASTM standards?

2 A There are four components of a Phase 1  
3 assessment. One, a review of all readily  
4 available records. Two, a site reconnaissance  
5 study, walking the site, reviewing the site, its  
6 boundaries, and the interior thereof. Three,  
7 interviews with the site owners or operators.  
8 And, four, of course, the preparation of the  
9 report based upon those first three steps.

10 Q Could you please summarize the results  
11 of your report prepared according to those general  
12 steps?

13 A The site has been utilized in the past  
14 for gas storage only. There is no record of well  
15 drilling on the site. There were no site adjacent  
16 hazardous waste sites which appeared to have any  
17 potential for affecting the proposed plant site.  
18 There were no hazardous substances or unidentified  
19 containers observed on the property.

20 There was no significant ground  
21 staining. There was minimal staining in the  
22 vicinity of a former truck loading area. There  
23 was no indication from the environmental databases  
24 and from local regulatory agency records of any  
25 prior contamination at the site.

1 Q And so what was your overall conclusion?

2 A Based on the above, and in accord with  
3 the standards, I concluded that there were no  
4 recognized environmental conditions which could be  
5 identified.

6 Q Did you locate any sumps on the site?

7 A No, there were none.

8 Q And were there any sumps nearby?

9 A There was a sump approximately 400 feet  
10 northwest of the site, down gradient from it.  
11 Significantly down gradient.

12 Q And approximately how far was that from  
13 the site, again?

14 A About 400 feet from the nearest site  
15 boundary.

16 Q Do you know anything about that sump?

17 A It was reported to have contained wash-  
18 down water and rainwater from the gas plant that's  
19 no longer in service. There was a remediation in  
20 1992.

21 Q And are well drillings -- well drilling  
22 records generally available?

23 A Yes, they are.

24 Q And reliable?

25 A They are maintained by DOG, and of

1 course also maintained by the operator. They go  
2 back to the early 1900's on this particular  
3 oilfield.

4 Q With regard to the gas storage tanks  
5 that are on the site, could you comment on their  
6 appearance and their state of maintenance?

7 A They were generally well maintained,  
8 painted. There were no signs of corrosion.

9 Q And could you comment on the piping at  
10 the site?

11 A There's a substantial amount of above-  
12 ground piping at the site. That piping, and the  
13 pipe racks, appear to be well maintained.

14 Q Could there be underground piping?

15 A Yes, of course there could, particularly  
16 with respect to the natural gas storage operation.  
17 But virtually all of that piping appeared to be  
18 above ground.

19 Q And again, that's the only use that you  
20 were able to determine that has been previously  
21 made of the property?

22 A That is true.

23 Q Did you review the sites listed in an  
24 attachment to the testimony filed by CURE, by Dr.  
25 Fox, dated January 12, 2000, and its preceding --

1 I believe it -- I can't give you the exact exhibit  
2 number, I'll refer to it by title, Naval Petroleum  
3 Reserve Number 1, Elk Hills, California, RCRA  
4 Facility Assessment, dated June 30, 1998?

5 A Yes.

6 Q And that site assessment, there's  
7 appended to that excerpt from that, certain sites  
8 that were within the Elk Hills oilfield?

9 A That is correct.

10 Q And do any of those sites which are  
11 listed occur within the power plant site?

12 A No.

13 Q Do you know the depth to groundwater at  
14 the site, and its quality?

15 A It's approximately 900 to 950 feet. The  
16 quality is 5,000 to 7,000 TDS.

17 Q And so would you characterize that as  
18 generally poor quality?

19 A That's literally unusable groundwater.

20 Q When you made your site visits, did you  
21 notice any petroleum product odors?

22 A No, I did not.

23 Q Did you notice a depression in the  
24 center of the site, or another in an ephemeral  
25 drainage to the east? I'm referencing a quotation

1 from Dr. Fox's testimony at page 4.

2 A No. I saw that reference, and I do not  
3 recall any such depression, and certainly there  
4 was no ephemeral drainage on the site that I  
5 observed.

6 Q And you're aware of the reference in  
7 that section of the testimony I just referenced  
8 to the observation by a cultural resource surveyor  
9 of an odor at the site?

10 A I am. We observed no odors. Or I  
11 observed no odors. And I'm not sure they were  
12 precisely onsite, perhaps.

13 Q Thank you. Could you comment further on  
14 the hydrocarbon staining that you noted in your  
15 report, and its significance?

16 A Yes. It was in the vicinity of the  
17 truck loading area. It appeared to be crankcase  
18 oils, or lubricating oil drainage. It was not  
19 significant to an extent, and certainly de minimus  
20 within the context of the standards.

21 MR. MILLER: Thank you. That concludes  
22 the presentation. These witnesses are tendered  
23 for cross examination.

24 HEARING OFFICER WILLIAMS: Sir, I have  
25 one question before cross examination.

1                   How do you define sump for the purpose  
2                   of your analysis?

3                   THE WITNESS: Sump is a depression, an  
4                   artificial depression, normally created by  
5                   oilfield operators for the purpose of containing  
6                   drainage, drilling muds, that type of thing. And  
7                   there were no such depressions.

8                   HEARING OFFICER WILLIAMS: Thank you.

9                   Any cross?

10                  MS. WILLIS: Staff doesn't have any  
11                  cross at this time.

12                  MS. REYNOLDS: I have a few questions.  
13                  Be very brief.

14                  CROSS EXAMINATION

15                  BY MS. REYNOLDS:

16                  Q     Mr. Tow, prior to conducting the Phase 1  
17                  for this project, had you done any work at the Elk  
18                  Hills Oilfield?

19                  A     I have not personally. The firm has  
20                  done a good deal of biological work at the oil --  
21                  Elk Hills Oilfield.

22                  Q     Did your Phase 1 cover the project  
23                  linears or just the plant site?

24                  A     It covered the plant site only.

25                  MS. REYNOLDS: That's all I have.

1                   MR. MILLER: And we appreciate the  
2                   schedule change by all parties.

3                   THE WITNESS: I appreciate it. Thank  
4                   you.

5                   MR. MILLER: We do, I'm reminded by my  
6                   staff that we need to move the exhibits into  
7                   evidence. And so we will so move.

8                   HEARING OFFICER WILLIAMS: Is there any  
9                   objections to the exhibits that are listed in Mr.  
10                  Tow's testimony?

11                  MS. REYNOLDS: No. Are you also moving  
12                  Mr. Cronk's --

13                  MR. MILLER: And Mr. Cronk as well,  
14                  please.

15                  MS. REYNOLDS: My only -- I just want to  
16                  make sure I have a chance to cross examine Mr.  
17                  Cronk on the -- the issues that -- okay.

18                  HEARING OFFICER WILLIAMS: Those will be  
19                  admitted.

20                  (Thereupon, the Waste Management  
21                  sections of Exhibit 1 and  
22                  Appendix H were received into  
23                  evidence.)

24                  MR. MILLER: Thank you.

25                  (Inaudible asides.)

1 COMMISSIONER MOORE: Cross examination  
2 for Dr. Fox.

3 MS. LUCKHARDT: Yes. Just a few. I'm  
4 sorry, every time I move my papers go sailing.

5 TESTIMONY OF

6 DR. PHYLLIS FOX

7 called as a witness on behalf of CURE, having  
8 previously been duly sworn, was examined and  
9 testified further as follows:

10 CROSS EXAMINATION

11 BY MS. LUCKHARDT:

12 Q Dr. Fox, isn't it true that there is an  
13 anhydrous ammonia tank existing relatively close  
14 to the proposed power plant site at this time?

15 A Not to my knowledge.

16 Q Could you please refer to your exhibit  
17 -- it would -- under Dr. Fox's testimony, which I  
18 believe is Exhibit 30, Tab A, which has the data  
19 requests of CURE to the Applicant, and the  
20 responses. If you'd look at the last page, which  
21 is marked on this section as page 6.

22 A I have it.

23 Q If you could look at the paragraph,  
24 first paragraph under number 23. If you could  
25 please read that, those two sentences.

1           A     Let's see. Number 23, the maximum  
2     amount of anhydrous ammonia stored at any time at  
3     the 35R cogeneration facility located immediately  
4     west of the proposed EHPP plant site is 10,000  
5     gallons.

6           Q     Thank you. Dr. Fox, in your testimony  
7     you commented about the significance of different  
8     impacts under different weather conditions.

9           A     Yes.

10          Q     And isn't it true that in general,  
11     realizing that I'm not a major in statistics, that  
12     the downwind concentration is inversely  
13     proportional to the wind speed?

14          A     In general, yes.

15          Q     And so that if you double your wind  
16     speed your concentrations are approximately half?

17          A     I think there might be an exponent  
18     involved, but yeah, that's the general idea.

19          Q     Okay. Thank you.

20                 And in your testimony, you spoke of  
21     double-walled tanks. You referenced a few  
22     projects. I just would like to clarify that the  
23     High Desert, La Paloma, and Pittsburg facilities  
24     use aqueous ammonia?

25          A     Yes, they all --

1 Q Is that correct?

2 A -- three use aqueous ammonia.

3 Q And then you also refer to studies that  
4 were done in the South Coast area, regarding the  
5 use of -- comparing the use of anhydrous ammonia  
6 and aqueous ammonia for other systems. And those  
7 were in environmental impact reports contained  
8 within your testimony?

9 A Correct.

10 Q Isn't it true that each of those  
11 facilities is located in a large population  
12 center?

13 A Yes.

14 MS. LUCKHARDT: I have nothing further.

15 HEARING OFFICER WILLIAMS: Staff?

16 MS. WILLIS: We have no questions.

17 HEARING OFFICER WILLIAMS: Staff, do you  
18 have some rebuttal testimony?

19 MS. REYNOLDS: Actually, I have a couple  
20 of redirect questions.

21 HEARING OFFICER WILLIAMS: Okay.

22 REDIRECT EXAMINATION

23 BY MS. REYNOLDS:

24 Q Dr. Fox, when you evaluated the met  
25 conditions and the relationship between the met

1 conditions that could possibly be experienced at  
2 the site, and the significant impacts, could --  
3 could you explain how you did that and how you  
4 came to your conclusion that -- I believe you said  
5 on direct, 75 percent of the time the met  
6 conditions would cause a significant impact. Can  
7 you address that?

8 A Yes. I took the Applicant's worst case  
9 tank scenario, which was at the top of Table 1 in  
10 my earlier testimony, and the Applicant in that  
11 analysis used a stability class of F and a wind  
12 speed of 1.5 meters per second.

13 I repeated that identical analysis using  
14 a large number of other combinations of  
15 meteorological conditions. I did F at four meters  
16 per second, I did A at three, I did B at four, I  
17 did C at four, I did D at four, and I did E at  
18 four. That particular set of met conditions  
19 corresponds to the conditions that you would  
20 expect to see 75 percent of the time.

21 And I'd like to put back up on this  
22 overhead a figure, which won't be controversial,  
23 because we've already seen it.

24 MS. LUCKHARDT: Has any of this analysis  
25 been filed?

1 HEARING OFFICER WILLIAMS: Counsel?

2 MS. LUCKHARDT: Has any of this analysis  
3 been previously filed that we're referring to here  
4 today?

5 MS. REYNOLDS: This is part of her  
6 determination of the significant impacts for the  
7 project. And you asked her on cross a question  
8 about met data.

9 MS. LUCKHARDT: I asked her about met  
10 data. I did not ask her about significant  
11 impacts.

12 MS. REYNOLDS: Well, they're  
13 interrelated.

14 MS. LUCKHARDT: I simply asked her about  
15 the relationship of met data --

16 COMMISSIONER MOORE: Well, wait. Let's  
17 go back to the question that Jane just asked.

18 Was any of -- were the calculations that  
19 Dr. Fox is referring to right now in the different  
20 met conditions previously filed?

21 MS. REYNOLDS: No.

22 THE WITNESS: There --

23 MS. REYNOLDS: They were not.

24 Oh, go ahead.

25 THE WITNESS: There's a discussion of

1       this meteorological condition issue in my written  
2       testimony on Hazardous Materials. And the  
3       conclusions that I drew there were based on the  
4       analyses that I'm talking about. I just didn't  
5       put all the gory detail of the calculations in my  
6       written testimony.

7               MS. LUCKHARDT: There's -- there's no  
8       mention of any analysis. There is a one sentence  
9       conclusory statement in her testimony on this  
10      issue.

11             HEARING OFFICER WILLIAMS: Where is  
12      that?

13             COMMISSIONER MOORE: See if you both  
14      come to the same page.

15             (Inaudible asides.)

16             MS. LUCKHARDT: And in fact, it states  
17      that this analysis would --

18             HEARING OFFICER WILLIAMS: Where are you  
19      speaking from, Counsel?

20             MS. LUCKHARDT: I'm -- okay, I'm sorry.  
21      I'm looking at page 10 of her testimony, third  
22      paragraph, none of the attachments. Just the  
23      basic testimony, page 10, third paragraph, bottom  
24      sentence. When she's talking about the  
25      relationship of different meteorological

1 conditions, she says, this analysis would  
2 demonstrate that. She does not in that instance  
3 indicate any -- indicate to me that any additional  
4 analysis has been done.

5 COMMISSIONER MOORE: Dr. Fox, do you  
6 have another citation that you're referring to  
7 when you say that you already filed the analytics  
8 here?

9 THE WITNESS: No. This is -- this is  
10 the summary of what I did.

11 MS. REYNOLDS: May I also state that we  
12 are allowed to do rebuttal testimony, and the  
13 Applicant has done rebuttal testimony, too. And  
14 this met data issue was further explored by both  
15 Applicant and staff during their testimony on  
16 Tuesday.

17 MS. LUCKHARDT: We did not provide  
18 additional analysis.

19 MS. REYNOLDS: You may not --

20 MS. LUCKHARDT: You're indicating that  
21 -- that you have done a variety of modeling, or --  
22 or general summary studies.

23 MS. REYNOLDS: Well, in staff's  
24 testimony on Tuesday I asked them whether they had  
25 analyzed a range of meteorological conditions, and

1       they said yes. But there's no data anywhere.

2               MS. LUCKHARDT: But they did not provide  
3       that data, nor did they base any of their  
4       conclusions upon that data. That was in response  
5       to a question from you, and when asked if they  
6       recalled any of the results the answer was no.

7               COMMISSIONER MOORE: Okay. Hold on one  
8       second.

9               THE WITNESS: Can -- can I make a  
10      response to that? In staff's --

11              MS. LUCKHARDT: Excuse me. Is it  
12      appropriate for the witness to be responding in  
13      this instance?

14              COMMISSIONER MOORE: It probably isn't,  
15      under these circumstances. So let me just confer  
16      with Counsel here for a second.

17              (Inaudible asides.)

18              COMMISSIONER MOORE: Okay. We're going  
19      to -- I'm going to -- we're going to -- I'm going  
20      to overrule the objection based on the fact that  
21      in earlier testimony, Dr. Fox actually talked  
22      about this methodology and got it on the -- on the  
23      record already.

24              However, what that means is that what  
25      you're asking for, Counselor, is redundant. And

1       so -- largely redundant.  So I would say that  
2       since Dr. Fox did talk about the different met  
3       zones and the different calculations that she  
4       used, it's already on the record.  I'm not sure  
5       that you need to -- to put it on again.

6               I would say, for future reference, that  
7       although the sentence that is here indicates that  
8       an analysis is done, it certainly begs a qualifier  
9       for -- for documentation, a footnote or a  
10      reference point.  It's -- it's novel enough, in  
11      terms of the approach, that it seems to me it begs  
12      to be called out.

13             So with that, I would -- I'd ask you to  
14      ask a different question of your witness.

15             MS. REYNOLDS:  I can ask a more general  
16      question without going into the numbers, if that  
17      --

18             COMMISSIONER MOORE:  Yeah, I don't think  
19      we -- in other words, I don't think we need to  
20      revisit it.  We've overridden the objection, but  
21      on the other hand we've indicated that that  
22      information has already come to us.

23             MS. REYNOLDS:  I'm sorry, I'm trying to  
24      reformulate.

25      ///

1 BY MS. REYNOLDS:

2 Q Dr. Fox, can you answer generally why  
3 you believe that restricting met conditions to the  
4 worst case is not appropriate in evaluating the  
5 significant impacts of the project?

6 MS. LUCKHARDT: Isn't this beyond the  
7 scope of my cross?

8 HEARING OFFICER WILLIAMS: I don't think  
9 so, Counsel.

10 Go ahead and answer the question, Dr.  
11 Fox.

12 THE WITNESS: Generally, the worst case  
13 met conditions occur a very small percentage of  
14 the time. In this case, the number that Mr. Tyler  
15 uses is about two percent. And if you take a  
16 probability of an accident and you multiply it by  
17 two percent, you are reducing it by a significant  
18 amount. And in most cases, it would reduce it  
19 below the significance threshold.

20 However, there are a wide range of  
21 meteorological conditions which are not the worst  
22 case conditions, which would result in impacts  
23 almost equal to those of the worst case, other  
24 stability classes and other wind speeds that occur  
25 very commonly. And those other sets of

1 conditions, of which there are many, would still  
2 show a significant consequence of the accident.

3 Q Dr. Fox, just so the record is clear,  
4 you're -- are you advocating for the use of met  
5 conditions and probabilities associated with met  
6 conditions in doing this type of analysis?

7 A No, I'm not advocating for it.

8 Q On cross examination there was a  
9 discussion about whether the tanks that are  
10 double-walled for other projects use aqueous  
11 ammonia or anhydrous. Can you address whether  
12 there are any substantial differences between  
13 using a double-walled tank for aqueous ammonia  
14 versus anhydrous ammonia?

15 A As far as the applicability of double-  
16 walled tanks for aqueous versus anhydrous, it  
17 shouldn't make any difference. Double-walled  
18 tanks are applicable no matter what the state of  
19 the ammonia. In fact, there are design codes,  
20 British design codes for anhydrous ammonia storage  
21 that specifically recommend the use of double-  
22 walled tanks for anhydrous ammonia storage.

23 Q On cross exam you were asked questions  
24 about the relationship between the dosage or  
25 ammonia concentration that could occur at a

1       receptor location, and wind speed. And you said  
2       generally it was a factor of two. Can you provide  
3       more explanation about that relationship?

4           A     I don't have the equations at my  
5       fingertips, so I -- I don't know exactly. But I  
6       -- I want to leap up to the overhead thing and put  
7       a figure up here, and just talk in general about  
8       it.

9                     This is Figure 3.2-2 from the AFC. And  
10       I want you to ignore these isopleth lines on here,  
11       because they're not part of the remarks that I  
12       want to make.

13                    I simply want to point out --

14                    HEARING OFFICER WILLIAMS: Dr. Fox, let  
15       us identify that particular exhibit for the  
16       record. It's already been marked. That would be  
17       -- that would be 27A.

18                    THE WITNESS: 27A. Okay, 27A shows a  
19       couple of isopleths on it. They're not relevant  
20       to the remarks that I want to make.

21                    The only point that I want to make is  
22       that if one were to draw isopleths on this figure  
23       corresponding to a range of different  
24       meteorological conditions, like wind speeds of  
25       1.5, 2, 3, and 4 meters per second, with various

1 combinations of stability classes, you would find  
2 that the isopleth would not vary by a factor of  
3 two, if you doubled the wind speed, but the  
4 isopleths would occur in this -- this kind of a  
5 range here. In other words, you wouldn't half the  
6 distance from the ammonia tank to the isopleth by  
7 doubling the wind speed, necessarily. All of the  
8 isopleths fall within a fairly narrow band, and  
9 they all would encompass Elk Hills Road.

10 HEARING OFFICER WILLIAMS: Okay. Dr.  
11 Fox, I'm going to ask that that be separately  
12 marked as Exhibit 27C. And the exemplar will have  
13 that notation that you just made with your  
14 testimony.

15 Is there any objection to that?

16 MS. LUCKHARDT: You've already overruled  
17 my existing objection to her moving the areas that  
18 are here are beyond the scope, so --

19 HEARING OFFICER WILLIAMS: Okay, 27C, if  
20 you could -- will be admitted into the record.

21 (Thereupon, Exhibit 27C was  
22 marked for identification.)

23 MS. REYNOLDS: Do you want to make that  
24 as a new --

25 HEARING OFFICER WILLIAMS: Yes, let's

1 mark it as a new exhibit. We can move on. You  
2 can just submit it at some point later.

3 MS. REYNOLDS: That's -- those were all  
4 the questions I had on redirect. Do you want to  
5 assign this a number now?

6 COMMISSIONER MOORE: We'll do that -- we  
7 already did, 27C.

8 HEARING OFFICER WILLIAMS: 27C.

9 MS. REYNOLDS: Oh, I'm sorry. I thought  
10 that was the prior number for this --

11 HEARING OFFICER WILLIAMS: No, no.  
12 That's -- that's -- the exhibit that she just  
13 wrote will be 27C.

14 Counsel, do you have any questions based  
15 upon that examination?

16 MS. LUCKHARDT: Just one second. No,  
17 nothing further.

18 HEARING OFFICER WILLIAMS: Okay.

19 MS. WILLIS: No further questions.

20 HEARING OFFICER WILLIAMS: Okay. I  
21 think you've got -- staff, do you have rebuttal  
22 testimony?

23 MS. WILLIS: We do. Does Applicant --

24 MS. LUCKHARDT: We have a short amount  
25 of rebuttal.

1 HEARING OFFICER WILLIAMS: Okay.

2 Well, we'll proceed into rebuttal with  
3 the Applicant.

4 MS. LUCKHARDT: I guess I would ask  
5 first, Mr. Rowley, if he can identify on one of  
6 perhaps Dr. Fox's graphs the location of the  
7 existing anhydrous ammonia tank.

8 HEARING OFFICER WILLIAMS: I would note  
9 that Commissioner Moore just stepped out of the  
10 room. Does any party have an objection to us  
11 proceeding?

12 MS. LUCKHARDT: I think I do at this  
13 point.

14 HEARING OFFICER WILLIAMS: Well, we'll  
15 wait. Let's go off the record.

16 (Off the record.)

17 COMMISSIONER MOORE: Fire up.

18 HEARING OFFICER WILLIAMS: All parties  
19 who were present at the break are again present,  
20 and we were proceeding on to rebuttal with the  
21 Applicant.

22 TESTIMONY OF

23 JOSEPH ROWLEY

24 called as a witness on behalf of the Applicant,  
25 having previously been duly sworn, was examined

1 and testified further as follows:

2 DIRECT EXAMINATION

3 BY MS. LUCKHARDT:

4 Q And I believe we had begun -- began with  
5 a question of Mr. Rowley, referring to -- now I've  
6 forgotten -- one of -- do we need an overhead,  
7 Joe?

8 A Yeah, that would be helpful.

9 Q If we could borrow Dr. -- one of Dr.  
10 Fox's overheads. One of the 27A, B range, I think  
11 is probably an appropriate one to use. And I had  
12 previously requested that Mr. Rowley locate the  
13 existing anhydrous ammonia tank on that map.

14 A This is Figure 3.2-2 --

15 HEARING OFFICER WILLIAMS: Let the  
16 record reflect that Mr. Rowley has what we've  
17 previously marked as Exhibit 27C. And that is on  
18 the overhead, and he is discussing that exhibit.

19 THE WITNESS: This exhibit shows the  
20 proposed facility and the immediate surroundings.  
21 The existing 12,000 gallon anhydrous ammonia tank  
22 is located at the 35R cogen facility, at the tip  
23 of my pen, right about --

24 COMMISSIONER MOORE: Mr. -- Mr. Rowley,  
25 could you get something to mark that with, and

1 place your initials under -- under the designation  
2 that you use, please? Put your initials on it,  
3 just --

4 THE WITNESS: It's the right color, too.  
5 That mark is the location of the existing 12,000  
6 gallon anhydrous ammonia storage tank that's  
7 located immediately west of the proposed facility,  
8 at the 35R cogeneration complex.

9 BY MS. LUCKHARDT:

10 Q Mr. Rowley, there's been some discussion  
11 about the use of double-walled tanks for anhydrous  
12 ammonia. Do you have an opinion on the use of  
13 double-walled tanks for anhydrous ammonia?

14 A I've seen many anhydrous ammonia tanks,  
15 well in excess of a hundred large, small, all  
16 different sizes and services, both for power  
17 plants, agricultural use, railcar tanks. I have  
18 never seen a double-wall anhydrous ammonia tank,  
19 nor am I aware of a single double-wall anhydrous  
20 ammonia tank existing.

21 Q And can you explain why you would use a  
22 double-walled tank for aqueous ammonia?

23 A Aqueous ammonia naturally, since it  
24 contains water, is a different substance than  
25 anhydrous ammonia. Aqueous ammonia is -- has a

1 corrosive nature. There's a potential for  
2 corroding the tank from the inside. As is often  
3 the case in corrosive service a -- and even with  
4 fuel oil, when water gets in fuel oil, it's  
5 commonplace to put a double bottom tank in a fuel  
6 oil tank. For the same reason, it's not  
7 unreasonable to consider a double-wall for a  
8 aqueous ammonia tank because there's potential for  
9 the first wall corroding through from the inside,  
10 due to the ammonia water mixture, and making it  
11 outside of that -- of that first tank.

12           Whereas with anhydrous ammonia,  
13 anhydrous ammonia does not pose a significant  
14 corrosion potential, and the corrosion from an  
15 anhydrous ammonia tank that we're concerned about  
16 with be corrosion on the outside of the tank, due  
17 to, say, rainfall on the tank collecting in some  
18 pocket where is a -- a bracket and causing  
19 corrosion on that little spot.

20           Q     Thank you. And I believe you were here  
21 and heard Dr. Fox make the reference that water  
22 deluge systems fail often. And she referenced the  
23 El Centro RMPP. Can you explain your role in the  
24 El Centro project, and with the El Centro RMPP?

25           A     I was the project manager of the El

1 Centro Unit 2 Repowering Project, and I directed  
2 the development of the El Centro RMPP. There is  
3 no indication whatsoever in the El Centro RMPP  
4 that water deluge systems fail often. That El  
5 Centro project included a 12,000 gallon anhydrous  
6 ammonia tank, which was included in the Commission  
7 decision on that project.

8 Q And do you have any experience in the  
9 design and operation of water deluge systems?

10 A Yes, I have designed and been  
11 responsible for both for the operation of --  
12 design and operation of water deluge systems for  
13 both anhydrous ammonia service, as well as other  
14 services.

15 Q And in your experience, do these deluge  
16 systems fail often?

17 A No, they do not. Water deluge systems  
18 are designed and operated under NFPA standards.  
19 These standards are designed for fire protection  
20 service. The water deluge valves and piping are  
21 especially designed for extremely high  
22 reliability, and in fact, in my experience that's  
23 the way they operate.

24 MS. LUCKHARDT: Thank you.

25 ///

1 TESTIMONY OF

2 GARY CRONK

3 called as a witness on behalf of the Applicant,  
4 having previously been duly sworn, was examined  
5 and testified further as follows:

6 DIRECT EXAMINATION

7 BY MS. LUCKHARDT:

8 Q Mr. Cronk, do the regulations permit  
9 placing an anhydrous ammonia tank within a  
10 building?

11 A No, they do not. Title 8 of the  
12 California Code of Regulations, Section 501  
13 specifically prohibits placement of an anhydrous  
14 ammonia tank within a building.

15 Q There has been some discussion of the --  
16 of RMPs in this project. Mr. Cronk, are there  
17 specific regulations governing the preparation of  
18 RMPs, process safety management plans, hazardous  
19 materials inventory, emergency business plans?

20 A Yes, there are.

21 Q And will these -- once these plans are  
22 prepared, are they typically reviewed by  
23 government agency?

24 A Yes.

25 Q Could you prepare these plans right now?

1           A     No, I could not do it at this time,  
2           simply because detailed design drawings are not  
3           available. We need to know tank specifications,  
4           we need to know deluge locations, piping  
5           locations, the building's exit routes, responsible  
6           persons, phone numbers; basically, we need final  
7           design criteria before we could prepare those  
8           plans.

9           Q     And that final design, would that be  
10          required for more than simply the anhydrous  
11          ammonia system? Would you need that design for  
12          the entire plant?

13          A     We would need final design for all those  
14          plans, yeah. Whether it included the ammonia  
15          tanks or any other hazardous material tanks.

16                           TESTIMONY OF

17                           STEVEN RADIS

18          called as a witness on behalf of the Applicant,  
19          having previously been duly sworn, was examined  
20          and testified further as follows:

21                           DIRECT EXAMINATION

22                           BY MS. LUCKHARDT:

23          Q     Mr. Radis, CURE presented failure ratio  
24          data from the Rijnmond -- is that how it's  
25          pronounced -- Rijnmond Report. Could you clarify

1 the information in that table? I believe we're  
2 referring to CURE's Exhibits 26 and 26A.

3 A I think it was stated something to the  
4 effect that these are very low probabilities that  
5 are listed here for very large releases.

6 I want to point out that this particular  
7 table is for an ammonia sphere, which is  
8 approximately 30 times larger than the ammonia  
9 tank that would be constructed at Elk Hills. I'm  
10 just -- that's 30 times, off the top of my head,  
11 so if I'm a little off, it's okay.

12 The failures represent essentially a  
13 failure mode, catastrophic failure of a tank,  
14 failure of a pipe associated with the tank. The  
15 amount of material released would be proportional  
16 to that failure. I think if we were to evaluate  
17 the probability for this project of releasing  
18 682,000 kilograms of ammonia, it's zero. There'll  
19 never be that much ammonia there.

20 But the probability that's stated here  
21 in this report would be appropriate for the  
22 complete loss of containment for a 24 kilogram --  
23 24,000 kilogram tank, as we would be having at the  
24 site.

25 In evaluating the other probabilities

1       and release sizes for piping, again, piping is  
2       proportional to the size of the vessel. You  
3       wouldn't have a eight or twelve inch pipe on a  
4       very small vessel. It would not make any sense.  
5       You size your vessel for the demand that you would  
6       have, and you would also size your piping to  
7       really carry no more than the demand. And in the  
8       case of this project, there would be excess flow  
9       valves to prevent any greater flow than would be  
10      necessary in the event of a piping failure.

11                So I just wanted to clarify that you  
12      can't look at a table like this and look at a  
13      probability and equate that to the gross amount  
14      that would be released, but only the proportion  
15      that would be released.

16                I think I'd also like to point out that  
17      the failure rates here are actually quite a bit  
18      lower than the failure rates that we used in our  
19      analysis. And there are various reasons. For  
20      one, these failures are looking at specific modes  
21      where we actually added several failures together,  
22      which would then result in a higher probability of  
23      failure.

24                Q     And CURE noted that your reference to  
25      the use of meteorological conditions applied to

1 the calculations for individual risk, and would  
2 not apply to the estimate of societal risk. Would  
3 you care to comment on this?

4 A Probably sound like a broken record. I  
5 -- if it's okay, we'll open a book again and read  
6 short --

7 Q Please identify the book.

8 A This is American Institute of Chemical  
9 Engineers, Guidelines for Chemical Process  
10 Quantitative Risk Analysis. It's been cited by  
11 all parties present.

12 On page --

13 MS. REYNOLDS: Actually, could we  
14 clarify whether that's been cited by all parties?  
15 I don't believe it's been cited by CURE.

16 THE WITNESS: I believe that it is. I  
17 would have to dig through --

18 MS. REYNOLDS: Was it cited in your  
19 testimony?

20 THE WITNESS: It is cited in our --

21 HEARING OFFICER WILLIAMS: Well, we can  
22 clarify that later. I don't think it's a major  
23 point. Continue.

24 THE WITNESS: Okay. It's also, as I had  
25 stated on Tuesday, it is also a companion book to

1 the Risk Analysis for Transportation.

2 On page 288 there's a discussion of  
3 societal risk, and it states, incidents must be  
4 subdivided into incident outcomes and incident  
5 outcome cases to evaluate each weather condition,  
6 wind direction, ignition case, and population  
7 size. And in parentheses it states, day and  
8 night.

9 Again, in calculating risk, weather  
10 conditions and wind direction are important.  
11 Obviously, we've had a lot of discussion that if  
12 the wind is not blowing towards a receptor, the  
13 risk of exposure is zero.

14 I don't think we need to belabor it  
15 anymore, but I just wanted to bring it up again in  
16 rebuttal.

17 BY MS. LUCKHARDT:

18 Q And what is your opinion of the use of  
19 workplace standards to address accidental  
20 releases?

21 A Workplace standards are developed to  
22 protect workers, obviously, from routine daily  
23 exposures that they would experience in their  
24 particular workplace. They are generally what we  
25 would consider no effect levels, in that if they

1 are exposed at concentrations lower than that  
2 level they would not experience any adverse health  
3 effects.

4 Many of these levels are designed to  
5 account for daily exposure at these levels. They  
6 do not apply to one-time exposures to accidental  
7 releases. There are no workplace standards that  
8 equate to accidents and having acceptable  
9 exposure.

10 MS. LUCKHARDT: Thank you. We have  
11 nothing further. The witnesses are available for  
12 cross.

13 HEARING OFFICER WILLIAMS: Cross  
14 examination?

15 MS. WILLIS: No cross examination.

16 MS. REYNOLDS: I have just a few  
17 questions.

18 CROSS EXAMINATION

19 MS. REYNOLDS: Mr. Rowley, on rebuttal  
20 I believe you stated that anhydrous ammonia tanks  
21 are more likely to, since they're less -- since  
22 anhydrous ammonia is less corrosive than aqueous,  
23 that anhydrous ammonia tanks are more likely to  
24 corrode from the outside due to precipitation. Is  
25 that correct?

1                   It doesn't mean that it's likely, but  
2           that's where you would look for potential  
3           corrosion, is on the outside. Yes.

4                   MS. REYNOLDS: Mr. Cronk, you stated  
5           that there are regulations in Title 8 of the  
6           California Code of Regs which prohibit placing  
7           anhydrous ammonia tanks in structures. Does that  
8           prohibition related to occupied structures?

9                   MR. CRONK: I don't think it specifies  
10          occupied structures. It just says structures,  
11          unless there are specifically used for that  
12          purpose.

13                  MS. REYNOLDS: For what purpose?

14                  MR. CRONK: For containment.

15                  MS. REYNOLDS: So if the structure is  
16          solely for containment, is it allowed?

17                  MR. CRONK: That's my understanding of  
18          the regulations, yes.

19                  MS. REYNOLDS: Who is responsible for  
20          preparing the final design criteria for the -- the  
21          plant and the ammonia system and all of that?

22                  MR. CRONK: What individual? You're  
23          saying who?

24                  MS. REYNOLDS: Or in the entity --  
25          entity.

1                   MR. CRONK: I would imagine it would be  
2                   the Applicant.

3                   MS. REYNOLDS: I have no further  
4                   questions.

5                   HEARING OFFICER WILLIAMS: Counsel, do  
6                   you have anything further?

7                   And you have rebut testimony, all right?

8                   MS. WILLIS: First of all, Mr. Loyer.

9                   TESTIMONY OF  
10                   JOSEPH LOYER  
11                   called as a witness on behalf of the Commission  
12                   staff, having previously been duly sworn, was  
13                   examined and testified as follows:

14                   DIRECT EXAMINATION

15                   BY MS. WILLIS:

16                   Q     Dr. Fox, in her presentation on the  
17                   overheads, discussed Elk Hills Road. Did you  
18                   consider Elk Hills Road in your analysis?

19                   A     Yes, I did.

20                   Q     And you -- can you please briefly  
21                   summarize that?

22                   A     I looked at the offsite consequence  
23                   analysis provided by the Applicant, and determined  
24                   from that analysis that they had calculated the  
25                   concentrations as I requested them to do so in my

1 data request -- I believe it was 9 -- at the road,  
2 and at a facility directly across the road from  
3 the proposed Elk Hills site.

4 I noted that the worst case unmitigated  
5 concentrations were at 20,000 ppm. I then  
6 investigated the traffic load on the road through  
7 the transportation analysis that was provided in  
8 PSA form at that time, and noted that the worst  
9 possibility of loading on the road was 90 cars in  
10 a rush hour situation. That's averaged over an  
11 hour.

12 Since I was looking at a half-hour  
13 standard, I divided that number in half and came  
14 up with 45 cars on the road potentially exposed to  
15 these higher concentrations. At that point, I  
16 decided that it was relevant to investigate  
17 further and find out what the potential for this  
18 release scenario to occur was.

19 Q And what did you determine?

20 A As I have testified to before, we found  
21 that the potential for this release, this worst  
22 case impact to occur was below de minimus.

23 Q Why did staff not require a double-wall  
24 tank?

25 A We don't believe it's necessary. The

1 chances of a worst case release scenario are so  
2 far below de minimus that we believe it's not  
3 necessary.

4 Q And you heard Applicant's previous  
5 testimony regarding storing the ammonia in an  
6 enclosed building or structure. Do you agree with  
7 their testimony?

8 A I'm -- I'm going to have to go back and  
9 look at Title 8 again. I -- I believe Applicant  
10 is right about that. I would not advocate storing  
11 a anhydrous ammonia tank inside of a building just  
12 from the explosive nature of ammonia. If it were  
13 to be released even in small amounts, it can be  
14 ignited.

15 MS. WILLIS: Thank you.

16 TESTIMONY OF

17 RICK TYLER

18 called as a witness on behalf of the Commission  
19 staff, having previously been duly sworn, was  
20 examined and testified further as follows:

21 DIRECT EXAMINATION

22 BY MS. WILLIS:

23 Q Mr. Tyler, Dr. Fox spent considerable  
24 time discussing the Rijnmond Table A8.7, and when  
25 she was discussing it she kept referring to

1 Section A, undesired events. Did you rely on this  
2 section of the table to come up with your estimate  
3 of catastrophic tank failure?

4 A No. And, in fact, Joe has that in his  
5 testimony, that -- that what I relied on out of  
6 that table and what I was discussing during my  
7 testimony was the fault tree that led to the  
8 probabilities of failure. Actually, Table A8.2,  
9 which -- which I have given all the parties,  
10 describes tanks and vessels.

11 HEARING OFFICER WILLIAMS: Could you  
12 give us a chance to --

13 THE WITNESS: Okay.

14 HEARING OFFICER WILLIAMS: -- find that.

15 MS. REYNOLDS: Wait, is this -- is this  
16 a new table that we're dealing with here?

17 THE WITNESS: This is part of the  
18 Rijnmond study, and I -- I've provided it to  
19 everybody as they requested.

20 MS. REYNOLDS: But this is a new -- this  
21 is a newly filed --

22 THE WITNESS: It's a different table --

23 MS. REYNOLDS: -- this is something we  
24 haven't seen --

25 THE WITNESS: -- it's not filed.

1 MS. REYNOLDS: -- before.

2 THE WITNESS: It's part of the Rijnmond  
3 study which we relied upon.

4 MS. WILLIS: Actually, Mr. Tyler does  
5 not even need to discuss it. We're just -- we're  
6 just rebutting the testimony of Dr. Fox that he  
7 relied on Table A, which he did not, and had never  
8 testified that he did.

9 So we do not have to bring this table in  
10 at this point, if -- he just wanted to point out  
11 that he was talking about Section C on that chart,  
12 the fault tree.

13 THE WITNESS: And -- and actually, the  
14 number in our testimony comes from this other  
15 table. And it's based on several different tanks  
16 at these facilities, not just the one type.

17 MR. LOYER: Not just ammonia.

18 THE WITNESS: Not just ammonia.

19 MS. REYNOLDS: Actually, based on this  
20 information I would like this new table entered  
21 into the record, and if it was truly the basis on  
22 which staff conducted its analysis, I think it  
23 should be in the record.

24 It was -- I think it was misleading on  
25 Tuesday, when Mr. Tyler pointed out this table and

1 read from it and didn't state that this actually  
2 wasn't the table that he relied on in his  
3 analysis.

4 THE WITNESS: Actually, I did caveat the  
5 fact that I wasn't sure, that I had to go back and  
6 look at it. The numbers in the testimony are one  
7 times ten to the negative six failures per year.  
8 That comes from Table A8.2. And it is for a large  
9 number of different types of tanks, including  
10 acrylonitrile storage, ammonia storage, chlorine  
11 storage, LNG storage, propylene storage, and  
12 hydro-sulphurizer --

13 HEARING OFFICER WILLIAMS: Mr. Tyler, is  
14 it already in the record?

15 THE WITNESS: This is the stuff that I  
16 -- that I just passed out.

17 MS. REYNOLDS: No, it's not in the  
18 record.

19 COMMISSIONER MOORE: So it is not --

20 THE WITNESS: It's not in the record.  
21 That's correct. And I just --

22 BY MS. WILLIS:

23 Q But you've referenced it in your  
24 testimony and --

25 A But we've referenced it in our

1 testimony. We referenced the whole Rijnmond  
2 study.

3 MS. REYNOLDS: Yeah. But it was not --  
4 the entire study was referenced in his testimony.  
5 It was not possible from the testimony to figure  
6 out which -- where in the --

7 HEARING OFFICER WILLIAMS: Okay. Well,  
8 let's mark it. Let's mark it -- mark it for  
9 identification next in order, which would be 31.

10 (Thereupon, Exhibit 31 was marked  
11 for identification.)

12 HEARING OFFICER WILLIAMS: And does  
13 everyone have a copy of it? And it's three pages?

14 COMMISSIONER MOORE: So your point is,  
15 Mr. Tyler, your point is not to use it again.  
16 Your point is to answer the question where did  
17 your -- your analytic analysis come from. And it  
18 is based on this table, not --

19 THE WITNESS: Correct. And the -- the  
20 fault tree that's attached to that same thing is  
21 what I was discussing on the day in question. And  
22 I was pointing out that there are many of the  
23 failure modes in the fault tree that staff has  
24 addressed specifically, so we believe that this --  
25 that these estimates are very conservative, not --

1 not -- they, we believe significantly  
2 underestimate the actual risk -- overestimate the  
3 actual risk of failure.

4 HEARING OFFICER WILLIAMS: Staff, are  
5 you willing to sponsor this exhibit?

6 MS. WILLIS: Yes.

7 HEARING OFFICER WILLIAMS: Okay. Any  
8 objection to Exhibit 31?

9 MS. REYNOLDS: No.

10 HEARING OFFICER WILLIAMS: So admitted.  
11 (Thereupon, Exhibit 31 was received  
12 into evidence.)

13 MS. WILLIS: Okay. Let's move on.

14 BY MS. WILLIS:

15 Q Dr. Fox began her testimony by stating  
16 that there is a moving target in staff's  
17 establishing significance between various projects  
18 that have been -- come before the Commission.

19 In your opinion, I know you've worked on  
20 other cases, has there been a moving target?

21 A No. And I think I -- I really want to  
22 point out that staff does not establish criteria.  
23 We do not establish significance criteria. We  
24 make recommendations to this Commission as to what  
25 we believe, in our best professional judgment,

1 constitutes a significant impact. That is subject  
2 to interpretation on each and every case we  
3 evaluate. And with the changes -- and with  
4 changes in -- in available information.

5 In -- in this case, what I -- what I've  
6 been trying to advocate is to inform the Committee  
7 that, in fact, it's within their judgment to  
8 utilize a risk between ten to the negative fourth  
9 and ten to the negative sixth, based on the best  
10 available information that I have, which is the UK  
11 study that's been talked about and which I also  
12 provided to everybody.

13 And I've discussed several times the  
14 risk of ten to the negative fourth for one  
15 fatality, ten to the -- ten to the negative fifth  
16 for -- for ten fatalities, and ten to the negative  
17 sixth for up to 100 potential fatalities.

18 Q Are there specific regulations  
19 addressing workplace handling of ammonia?

20 A Yes. There -- there are both -- there  
21 are both occupational exposure standards, which  
22 are relevant to routine expected and anticipated  
23 allowable exposures. There are also significant  
24 design criteria for the facilities that store,  
25 handle, and use ammonia in order to protect

1 workers.

2 Q Did Dr. Fox accurately characterize your  
3 use of various exposure criteria?

4 A No. Staff does not use the 75 ppm, 200  
5 ppm, 300 ppm, and 200 ppm as significance  
6 criteria. We use those as benchmarks to let us  
7 know what kind of consequences might be expected  
8 at various distances and locations. We have -- we  
9 have not advocated those as bright lines in any  
10 case, and I -- I have -- I don't believe we've  
11 ever indicated that those are significance  
12 criteria. They're simply benchmark exposure  
13 levels which, by the way, are explained in the  
14 appendix to our testimony, how -- how we're using  
15 them.

16 Q Mr. Tyler, did you rely on the operation  
17 of the water deluge system to reach your  
18 recommendations?

19 A No, we did not. We believe that the  
20 failure of the -- that the -- I'll take that back.  
21 That the probability of impact, significant  
22 impact, was already low enough, based on the  
23 proposed -- based on the facility that's been  
24 proposed by the Applicant, and the existing  
25 regulatory programs that would govern the use of

1       this material at this facility.

2           Q     Why do you feel the potential public  
3       exposure above 75 parts per million is acceptable?

4           A     Most of the exposures on the graph that  
5       -- that Dr. Fox presented are at the outer  
6       boundary of the 75 ppm.  They're also very  
7       localized in the context of that whole field.  If  
8       we were to take the probabilities that are  
9       associated with the accidental release and then  
10      incorporate wind speed, wind direction, stability  
11      class, and all the other factors that would be  
12      necessary to quantify the potential impact, or the  
13      -- the probability of impact on those individuals,  
14      it would be, I believe, considerably lower than  
15      even the de minimus level that we've determined in  
16      this case.  And the populations are -- are, again,  
17      relatively small.  This is not a highly developed  
18      urban area.

19          Q     Does CEQA direct the lead agency to  
20      evaluate the potential for significant impact?

21          A     That's correct.

22          Q     And could you describe the difference  
23      between accidental release and impact?

24          A     An accidental release does not imply  
25      impact.  An impact requires not only that the

1 release occurs, it requires that the release  
2 actually expose an individual to a concentration  
3 that's harmful. So the simple fact that we have a  
4 release doesn't create an impact. The impact is  
5 created after we have released the material and  
6 dispersion, the carrying of that material downwind  
7 in some wind direction, those isopleths basically  
8 are all the possible directions, so we have to  
9 have it in a specific direction where a receptor's  
10 present, and at a concentration that would be  
11 harmful.

12 Each of those additional things has a  
13 probability of occurrence. So CEQA directs us to  
14 look at that probability, the probability of  
15 significant impact, not the probability of  
16 accidental release.

17 Q Is there an occupational exposure  
18 standard applicable to accidental release?

19 A No, there is not. The only -- the only  
20 -- the only exposure standards I can think of that  
21 -- that are applicable to accidental releases are  
22 the ERPGs, and those are not applicable to the  
23 workplace.

24 Q And finally, why did you rule out  
25 earthquakes in your analysis?

1           A     Basically, this tank is -- will be  
2     designed to California's Seismic Design Code,  
3     which is, in my opinion, the -- one of the  
4     strictest, if not the strictest design criteria  
5     around. The experience that -- that we have had  
6     with power plants designed to those modern seismic  
7     codes are that we don't have major failures in  
8     power plants. We don't have -- to the best of my  
9     knowledge, there is no failure on record of an  
10    ASME pressure vessel designed to seismic  
11    standards. Anywhere.

12                So my belief is that those standards are  
13    very effective, and that the database used to  
14    derive the Rijnmond number is based on worldwide  
15    use of -- of pressure vessels over a very long  
16    period of time into the past, long before those --  
17    those earthquake codes, design codes were in  
18    place. Therefore, I believe that -- that that  
19    estimate that we used in our analysis is very  
20    conservative. And so we don't -- that's why I  
21    brought that up about the fault tree and the  
22    earthquakes.

23                MS. WILLIS: That's all. Thank you.

24                HEARING OFFICER WILLIAMS: Cross  
25    examination?

1 MS. LUCKHARDT: No questions.

2 MS. REYNOLDS: I just have a couple  
3 questions.

4 CROSS EXAMINATION

5 BY MS. REYNOLDS:

6 Q The table that you referred to, Table  
7 A8.2 in the Rijnmond Report, Exhibit 31, are those  
8 failure rates specific to anhydrous ammonia tanks?

9 A No. They are -- they are for all  
10 pressure vessels operated at similar -- at those  
11 similar pressures. However, I do believe they are  
12 applicable and -- and useful in extrapolating or  
13 in considering the risks of failure of an ammonia  
14 tank.

15 Q Are there specific -- are there failure  
16 rates for tanks specific to anhydrous ammonia  
17 available?

18 A There may be. I -- I believe that this  
19 is about as good a number as I could use. In my  
20 professional judgment, this is an appropriate  
21 number. I -- I don't --

22 Q Have you ever -- have you ever seen  
23 failure rates specific to ammonia tanks?

24 A I believe that -- that there may -- that  
25 the Canby study may have included them, but I

1       can't really recall for sure. But those are for  
2       older tanks, anyway.

3           Q     Okay.

4           A     So I -- I didn't use them. I think this  
5       is the best data.

6           Q     Based on the Table A8.2, Exhibit 31,  
7       this lists failure rate per year; correct?

8           A     That's correct.

9           Q     So what would the failure rate be over  
10      the 30-year life of the project?

11          A     It would be 30 times that number.

12          Q     Okay. And this table provides, does it,  
13      for -- for serious leakage, a range of six times  
14      ten to the negative six to 2.6 times ten to the  
15      negative three per year failure rate. Is that  
16      correct?

17          A     For serious leakage, yes.

18          Q     For catastrophic rupture it provides for  
19      a range of 4.6 times ten to the negative fifth to  
20      6.3 times ten to the negative seven per year;  
21      correct?

22          A     That's correct.

23          Q     And so would -- and the range would be,  
24      again, 30 times that, for over the life of the  
25      project?

1           A     That's correct. And so are the exposure  
2     criteria that I used. The -- the UK data that I  
3     used in basically comparing the impact to  
4     probability.

5           MS. REYNOLDS: That's all I have.

6           HEARING OFFICER WILLIAMS: Surrebuttal?  
7     Is that it?

8           MS. REYNOLDS: May I have a moment?

9           (Inaudible asides.)

10          MS. REYNOLDS: I just have one quick  
11     question.

12          HEARING OFFICER WILLIAMS: Okay.

13                     TESTIMONY OF

14                     DR. PHYLLIS FOX

15     called as a witness on behalf of CURE, having  
16     previously been duly sworn, was examined and  
17     testified further as follows:

18                     DIRECT EXAMINATION

19                     BY MS. REYNOLDS:

20           Q     Dr. Fox, have you seen anywhere tank  
21     failure rates for -- specific to anhydrous  
22     ammonia?

23           A     Yes, I have.

24           Q     Can you tell us where those are  
25     contained?

1           A     I believe that they are contained in  
2     Volume 1 of Lees, and they are also contained in  
3     an article by Baldock dated 1980.

4           Q     Is the Lees document that you cited the  
5     same document that staff cites in their staff  
6     assessment?

7           A     Yes.

8           Q     Okay.

9           HEARING OFFICER WILLIAMS:   Could you  
10    spell that last reference, Dr. Fox, please.

11           THE WITNESS:   L-e-e-s.

12           HEARING OFFICER WILLIAMS:   And there was  
13    another one?

14           THE WITNESS:   B-a-l-d-o-c-k.

15           HEARING OFFICER WILLIAMS:   Thank you.

16           MS. REYNOLDS:   That's all I have.

17           HEARING OFFICER WILLIAMS:   Is there  
18    anything further?

19           COMMISSIONER MOORE:   Okay.   Let's switch  
20    topics.

21           HEARING OFFICER WILLIAMS:   We'll now  
22    close the record on the topic of Hazardous  
23    Materials Management.   I think I've received all  
24    the exhibits, but if I haven't, then we'll have  
25    that exception.

1 MS. REYNOLDS: Actually, I think we --  
2 we marked Exhibit 27C, but I didn't move to have  
3 it entered into the record because I didn't have  
4 copies at that time.

5 HEARING OFFICER WILLIAMS: Okay. Is  
6 there any objection to 27C?

7 MS. LUCKHARDT: No.

8 (Thereupon, Exhibit 27C was received  
9 into evidence.)

10 MS. LUCKHARDT: The only thing is that  
11 -- is that the one that we now need to have?

12 MS. REYNOLDS: We can have it recopied,  
13 but that would be another one, I think.

14 MS. LUCKHARDT: The -- okay. I guess we  
15 need to now have another copy of that copied with  
16 Mr. Rowley's --

17 HEARING OFFICER WILLIAMS: Mr. Rowley's  
18 --

19 MS. LUCKHARDT: -- mark on it. So --

20 COMMISSIONER MOORE: Unless he wants to  
21 just go around and put a mark on each copy.

22 MS. LUCKHARDT: If I could have one copy  
23 --

24 MS. REYNOLDS: We'll -- we'll make  
25 copies of it at the next break.

1                   Oh, you know, you had asked us to put  
2                   excerpts from this book into the record. Do you  
3                   want to mark those as an exhibit? Did we do that  
4                   already?

5                   COMMISSIONER MOORE: I don't think we  
6                   need to. We've got it -- it's a published book,  
7                   and I think we can just reference it.

8                   HEARING OFFICER WILLIAMS: The reference  
9                   will be fine.

10                  MS. REYNOLDS: Okay.

11                  HEARING OFFICER WILLIAMS: The reference  
12                  -- we'll have the reference. We don't need it.

13                  (Inaudible asides.)

14                  COMMISSIONER MOORE: Let's go to Traffic  
15                  and Transportation.

16                  All right. Jane, are you prepared?

17                  MS. LUCKHARDT: We are organizing. I  
18                  have one more witness who's coming up. I have two  
19                  witnesses to call on Traffic and Transportation,  
20                  Mr. Mudry, Mr. Radis, both of whom have previously  
21                  been sworn.

22                  The materials are so worn, it takes me a  
23                  second to -- okay. So Mr. Mudry is available,  
24                  we'll start with him.

25                  Mr. Mudry has previously stated his

1        qualifications for the record.

2                                TESTIMONY OF

3                                DWIGHT R. MUDRY

4        called as a witness on behalf of the Applicant,  
5        having previously been duly sworn, was examined  
6        and testified further as follows:

7                                DIRECT EXAMINATION

8                                BY MS. LUCKHARDT:

9                Q        Mr. Mudry, if you could please identify  
10        the exhibits you are sponsoring in the area of  
11        Traffic and Transportation.

12                A        Yes. I'm sponsoring -- sorry about my  
13        voice, but it's -- it makes me speak loud, that's  
14        one good thing. I'm sponsoring those sections  
15        that deal with Traffic and Transportation in the  
16        AFC. Those were Sections 511, Traffic and  
17        Transportation; 518.3 on Cumulative Impacts; and  
18        Section 6511, Traffic and Transportation LORS.

19                Q        Are you sponsoring any other exhibits?

20                A        Yes. I'm also --

21                Q        Go ahead.

22                A        I'm also sponsoring Exhibit 2, which is  
23        Response to Staff Data Requests Number 19 through  
24        21, filed August 6th, 1999; Exhibit 3, Response to  
25        Staff Data Requests 63 through 78, filed on

1 September 24th, 1999; Exhibit 4, Response to Staff  
2 Data Requests 89 and 90, filed October 4th.

3 Exhibit 12, letter from Dennis Champion,  
4 Elk Hills Power, to Barry Hayslett, Kern County  
5 Roads Department, dated November 2nd, 1999.  
6 Exhibit 13, a letter from Barry Hayslett, Kern  
7 County Roads Department, to Marc Pryor, California  
8 Energy Commission, dated November 9th, 1999. And  
9 Exhibit 14, letter from Dennis Champion, Elk Hills  
10 Power, to Marc Pryor, California Energy  
11 Commission, dated November 18th, 1999.

12 Q And do you have any corrections to make  
13 to the exhibits which you're sponsoring today?

14 A No, I don't.

15 Q And are you sponsoring any further  
16 testimony in this proceeding?

17 A Yes. I'm sponsoring Attachment A to  
18 this document, which is entitled Testimony of  
19 Dwight R. Mudry regarding Traffic and  
20 Transportation, in support of the Application for  
21 Certification for the Elk Hills Power Project.

22 Q And do you adopt these -- these exhibits  
23 are your true and sworn testimony in this  
24 proceeding?

25 A Yes, I do.

1           Q     All right.  Mr. Mudry, could you please  
2     summarize your testimony?

3           A     Yes.  The Elk Hills Power Plant  
4     construction activities will add a moderate amount  
5     of traffic during the peak construction period.  
6     However, the existing traffic is expected to be --  
7     sorry.  The increase in traffic is expected to be  
8     minor compared to the existing traffic.  And the  
9     existing regional and local roadway capacity is  
10    adequate.  Therefore, the impact from construction  
11    of the Elk Hills Power Project is not expected to  
12    be significant.

13                Potential long-term traffic impacts  
14    associated with the operation of the Elk Hills  
15    Power Plant -- Project, sorry -- include the  
16    operational workforce, delivery of hazardous and  
17    non-hazardous materials, and hauling of waste  
18    generated during operations.  Operation of the  
19    project will require about 20 full-time personnel,  
20    and the increase in traffic due to operation and  
21    maintenance activities is not expected to be  
22    significant.

23           Q     Thank you.  I have just a few questions.  
24                Mr. Mudry, have you reviewed the  
25    testimony filed in this proceeding under Traffic

1 and Transportation by Dr. Fox?

2 A Yes, I have.

3 Q And in her testimony, she recommends  
4 that aqueous ammonia be used because there are far  
5 fewer accidents involving aqueous ammonia. Do you  
6 have any comments on that?

7 A Yes, I do. On page 7 of the CURE  
8 testimony, she -- Dr. Fox used data from the  
9 National Response Center, NRC, and there was data  
10 in a database that was cited. The data cited was  
11 -- was quoted as in the last nine years only one  
12 aqueous ammonia accident had occurred, compared to  
13 36 accidents involving anhydrous ammonia.

14 The NRC database is actually a database  
15 maintained by the Coast Guard, and it's fairly  
16 incomplete. Another database maintained by the  
17 Department of Transportation is much more  
18 complete. So I checked that database on the  
19 Internet. I found considerably different  
20 information on the aqueous ammonia.

21 The DOT Hazardous Materials Information  
22 System is actually the principal source of safety  
23 information for transportation. And one of the  
24 databases they have lists the top 50 hazardous  
25 materials for each year, incidents. And for 1996,

1       for example, there were a total of 13,937  
2       transportation incidents. It's a very  
3       comprehensive database. And for aqueous ammonia,  
4       there were 105 incidents in that one year for  
5       aqueous ammonia.

6               So that's very far different from the  
7       data cited by CURE, which mentioned only one  
8       incident for aqueous ammonia in nine years.  
9       Aqueous ammonia, in fact, was ranked number 26 on  
10      that list of the top 50 hazardous materials for  
11      1996. Other years had similar data.

12       Q      And on page 2 of Dr. Fox's testimony,  
13      she refers to the -- an earlier environmental  
14      document on the review of the NPR, the sale of the  
15      NPR-1 facility as having heavy traffic, and an  
16      accident rate of 2.95 accidents per million  
17      vehicle miles.

18             Do you see that reference?

19       A      Yes. That earlier reference is a 1997  
20      DOE supplemental EIS, for the sale of the NPR-1.

21       Q      And do you have any observations on that  
22      comment?

23       A      Yes. In the testimony it was -- the  
24      comments were used, there is quotes from that EIS  
25      that were used to indicate that there was heavy

1 traffic with a high incidence of accidents in the  
2 Elk Hills area. Those particular statistics that  
3 were quoted by Dr. Fox actually refer to the  
4 traffic that is on the oil and gas field; that is,  
5 it's not traffic that is on the road surrounding  
6 the gas field, or even Elk Hills Road, which  
7 crosses it.

8 Those are actually statistics that deal  
9 with the 311 vehicles, at the time, that actually  
10 operated on the oilfield, and those vehicles  
11 operate on dirt roads -- there's many hundreds of  
12 miles of roads on the oilfield -- dirt roads and  
13 paved roads. So it's -- it's inaccurate to state  
14 that those accident rates that are quoted in that  
15 EIS reflect at all the traffic conditions that are  
16 on surrounding roads.

17 It also mentioned, quoted heavy traffic  
18 from that study. Well, the quote really referred  
19 to heavy traffic on the oilfield. They considered  
20 in that document that 311 vehicles seemed to be a  
21 lot of traffic on the oilfield. Actually, in the  
22 AFC Table 511-3, and also on page 115 of the FSA,  
23 there's a table of traffic data in the surrounding  
24 areas. And on Elk Hills Road, which is the road  
25 that runs directly through the oilfield, there's

1 an average daily traffic of about 740 vehicles per  
2 day. And the capacity of that road is 8,000. So  
3 that this level, very low level of traffic should  
4 not be characterized as heavy traffic in the area.

5 MS. LUCKHARDT: Thank you.

6 And I'd like to turn my attention to Mr.  
7 Radis.

8 TESTIMONY OF

9 STEVEN R. RADIS

10 called as a witness on behalf of the Applicant,  
11 having previously been duly sworn, was examined  
12 and testified further as follows:

13 DIRECT EXAMINATION

14 BY MS. LUCKHARDT:

15 Q Mr. Radis, could you -- Mr. Radis'  
16 qualifications have been previously stated and  
17 provided in his written testimony.

18 Mr. Radis, could you please identify the  
19 exhibits that you are sponsoring in the area of  
20 Traffic and Transportation?

21 A I always like going second. I'm  
22 sponsoring the same sections as Dwight Mudry.

23 Q And would that be Section 511 and  
24 Section 6511 of the AFC, identified in this  
25 proceeding as Exhibit 1?

1           A     Yes.

2           Q     And do you have any corrections to that  
3 testimony?

4           A     No, I do not.

5                   MS. LUCKHARDT: We will forgo a summary  
6 in light of some of additional questions, unless  
7 you would prefer a summary.

8                   COMMISSIONER MOORE: Counselor, you're  
9 -- you're in control.

10                   (Laughter.)

11                   BY MS. LUCKHARDT:

12           Q     All right. Mr. Radis, in your opinion,  
13 is an analysis similar to the one performed for  
14 the Gaviota Facility, which is referenced in Dr.  
15 Fox's testimony, necessary to evaluate the  
16 potential impacts from transportation of ammonia  
17 to the project?

18           A     No, I don't. The Chevron study was  
19 performed to evaluate the transportation of  
20 anhydrous ammonia between Los Angeles and Santa  
21 Barbara County, specifically west of the City of  
22 Santa Barbara, as well as the two routes  
23 originally from Bakersfield and, in the revision  
24 to that document, an additional route from  
25 Stockton.

1           The reason I don't feel that in this  
2       case we would need it is the population densities  
3       along the proposed route, or the most likely route  
4       between Stockton and Elk Hills is mostly  
5       characterized as either rural farm or low density  
6       residential, or mixed use. The rural farm density  
7       is assumed to be about 20 people per square mile.  
8       And the mixed use populations are about a thousand  
9       people per square mile.

10           These values would compare to urban  
11       areas ranging between five and 10,000 people per  
12       square mile, and in the Santa Barbara study all  
13       the routes considered went through fairly dense  
14       populations both in southern Santa Barbara County,  
15       Los Angeles, as well as portions of San Luis  
16       Obispo and northern Santa Barbara County.

17           Q     And do the Guidelines for Chemical  
18       Transportation Risk Analysis, also referenced by  
19       Dr. Fox, provide benchmarks for determining the  
20       appropriate level of analysis?

21           A     In the introduction to the book there is  
22       a reference to, in general, the appropriate use of  
23       quantitative transportation risk analysis.  
24       Basically, you can spend weeks, if not months,  
25       studying transportation risk analysis, and in many

1 cases that would be warranted where you have a  
2 high potential for exposure of the population.

3 Specifically, I'll read one sentence in  
4 the introduction. Detailed quantitative  
5 transportation risk analysis should be used  
6 sparingly and only to that depth of study  
7 necessary to achieve a study's goals and  
8 objectives.

9 Probably --

10 MS. REYNOLDS: I'm sorry. Could you --  
11 I'm sorry, we didn't get the page reference.  
12 Could you --

13 THE WITNESS: Oh, I'm sorry. It's page  
14 2.

15 MS. REYNOLDS: Thank you.

16 BY MS. LUCKHARDT:

17 Q And would a detailed transportation risk  
18 analysis provide additional information that would  
19 help the decision makers in determining the  
20 potential impacts of the transport of ammonia to  
21 this project?

22 A In this case I would say no. Again, we  
23 know that the population density is quite low  
24 along most of the route. We had additional  
25 benefit of having the Santa Barbara County study

1       for the Chevron Gaviota Facility, which provides  
2       information on route specific accident rates,  
3       which are considerably lower than the generic rate  
4       used in the guidelines. As well as, like I said,  
5       detailed population data for each segment of the  
6       route.

7           Q     Based on your experience in performing  
8       risk assessments comparing the risks of  
9       transporting anhydrous and aqueous ammonia, would  
10      the use of aqueous ammonia substantially reduce  
11      the risk of an ammonia spill from transport to the  
12      project?

13           A     I think, as I probably touched on on  
14      Tuesday, but I'll do it again, the transportation  
15      spill probabilities are higher for aqueous ammonia  
16      equipment than they are for anhydrous, given that  
17      the specifications of these vessels are much  
18      different. The consequences for aqueous are lower  
19      than anhydrous, clearly, but they are not  
20      insignificant. There is still significant  
21      potential for exposure with aqueous ammonia.  
22      Given the climatic conditions of the Central  
23      Valley and the relatively high percentage of time  
24      that you have warm temperatures, especially in the  
25      summer, aqueous ammonia spills on an open highway

1 would result in a rapid release of ammonia from  
2 the spill.

3 In past studies that we have done to  
4 evaluate this, we have found that when you look at  
5 the risk criteria, whether it's a Santa Barbara  
6 County risk criteria for FN curves or, again, the  
7 probability of a given number of fatalities, or  
8 the United Kingdom Health and Safety Executive  
9 criteria, which I think we have already seen  
10 today, the probability of one or more fatalities  
11 is higher for aqueous ammonia than anhydrous.  
12 However, again, the probability of a greater  
13 number of fatalities is greater for anhydrous  
14 ammonia.

15 We've had a lot of reference to  
16 transportation studies that have been done in the  
17 South Coast Air Basin, which we either prepared  
18 most of those or prepared the reports that were  
19 used as the basis for those. And basically, when  
20 you have the type of population density you do in  
21 Los Angeles, you would have very large numbers of  
22 fatalities in the event of an accidental release.

23 The agencies down there have made the  
24 decision, as we've heard, that that would be  
25 unacceptable, regardless of what the probability

1 is. Here, we have a case where we have very  
2 little population densities over large percentages  
3 of the transportation route. And so the  
4 probability of seeing large numbers of fatalities  
5 is quite low.

6 I almost forgot my point, which I always  
7 forget.

8 There is also reasonably significant --  
9 and I shouldn't use that word, but substantial  
10 environmental risk associated with aqueous  
11 ammonia. Unlike anhydrous, which would vaporize  
12 quickly, if you were to spill aqueous ammonia it  
13 would more than likely find its way into whatever  
14 drainage is in the area. And a spill of aqueous  
15 ammonia into a creek or a river would probably  
16 result in, again, substantial environmental  
17 impacts to that ecosystem.

18 Q And there seems to be some confusion  
19 regarding the risk of an accident on rural versus  
20 urban freeways. CURE, of course, through a table  
21 in the guidelines that we referenced before as  
22 demonstrating that rural roadways have a lower  
23 risk of accident. Is her use of this citation  
24 consistent with your understanding of accident  
25 risks on rural and urban roadways?

1           A     Yes. Urban roadways clearly have higher  
2     accident rates than rural roadways, which would be  
3     obvious to anybody who drives in an urban area,  
4     given the congestion. The spill probability,  
5     however, is actually slightly lower. But if you  
6     take the combined accident rate and spill  
7     probability, rural roads are considerably safer  
8     than urban roads.

9                 To probably dive into that further, in  
10    both urban and rural areas, accident rates are  
11    quite a bit lower for freeways where you have  
12    limited access. And I think in the case, when you  
13    look at the proposed project, a vast majority of  
14    the transportation route would be along Interstate  
15    5, which would be classified as a freeway with  
16    limited access. And when we -- limited access,  
17    we're talking about minimal cross traffic,  
18    essentially on- and off-ramp type access to the  
19    roadway.

20                Even in urban areas, these roadways have  
21    relatively low accident rates, almost rivaling  
22    rural accident rates. A part of that might be  
23    because they're not moving very fast, and clearly  
24    the probability of spill wouldn't be too great.  
25    But again, for this particular project, the

1 transportation routes would be characterized by  
2 probably lower than average accident and spill  
3 probabilities.

4 Q And can you cite to a specific reference  
5 in the guidelines to support that?

6 A Yeah. This is in Table 2-7, Guidelines  
7 for Chemical Transportation Risk Analysis, and it  
8 actually is included in Dr. Fox's testimony.

9 Q And CURE applies the health risk  
10 assessment significance threshold to the  
11 probability and consequence analysis for the use  
12 of ammonia by the project. Is that a correct use?

13 A There's been a lot of reference to  
14 thresholds of risk. And many times there's no  
15 reference as to what that risk represents, whether  
16 it's a cancer risk or the risk of a release, or  
17 the risk of an injury or fatality.

18 In Dr. Fox's testimony, there is a risk  
19 level of -- I want to say one times seven -- one  
20 in a million. And the reference cited is cancer  
21 risk management, which I really don't feel is an  
22 appropriate application of that risk criteria.  
23 Again, as we're discussing over and over, there  
24 are established criteria that are, I would say  
25 widely used in both the United Kingdom and as

1       adopted in Santa Barbara County that specifically  
2       cite the acceptable probabilities of fatalities  
3       and/or injuries.

4           Q     And are you familiar with the California  
5       Fertilizer Association's Anhydrous Ammonia  
6       Transportation Safety Program?

7           A     Yes.

8           Q     And is this a government sponsored  
9       program?

10          A     No.

11          Q     And can you tell me what you think of  
12       this program?

13          A     I think actually it's -- it's not a bad  
14       program. It clearly is better than not having  
15       anything else in place. There are a lot of basic  
16       elements that are in this program that we  
17       routinely recommend to many of our clients. I  
18       think the -- the issue we have with the CFA  
19       program is that government regulations are -- are  
20       continually changing, and there are other programs  
21       out there, and I think a 30 year requirement of a  
22       specific program may not really be appropriate,  
23       given that there could be future regulations or  
24       programs that would come into place that might be  
25       better.

1           Q     And Dr. Fox recommends restricting  
2     deliveries to night and early morning hours.  
3     Given the location of this project, would you  
4     support these restrictions?

5           A     Probably not   I think nighttime  
6     deliveries in urban areas make some sense, in that  
7     the accident rates are lower given that you don't  
8     have nearly as many people on the road.  In  
9     addition, the population that's there is  
10    essentially sheltered in place during most of  
11    these accidents.  In other words, they are in  
12    their homes, they're in buildings, and they  
13    frequently, in the case especially of an ammonia  
14    release, would be left in place because it's more  
15    hazardous to evacuate them.

16                   The downside of that type of delivery is  
17    that you clearly have higher potential for  
18    accidents due to driver fatigue and poor  
19    visibility, or less visibility than you would have  
20    during the daytime, on average.  Again, in urban  
21    areas that probably makes sense.  In rural areas,  
22    it probably makes little difference.

23           Q     In your opinion, would the use of steel  
24    cylinders to reduce the risk -- would the use of  
25    steel cylinders reduce the risk of an ammonia

1 release?

2           A     This is something that was, again,  
3 studied in the Chevron report. The problem with  
4 steel containers are that they are quite -- quite  
5 rigorous. You can drop them off the back of a  
6 truck and they might not leak. But it  
7 significantly, again, increases the handling of  
8 ammonia. And every time you handle ammonia, you  
9 really increase the probability that you're going  
10 to have a release. We did study this for the  
11 Chevron project. It does reduce the consequences  
12 of a release because you have smaller volumes  
13 typically. You might limit that to a ton per  
14 container.

15                     However, because you have many more  
16 containers, and you have much more handling, the  
17 frequency and probability of low numbers of  
18 fatalities, for example, one fatality, is actually  
19 increased. However, you do decrease, as with  
20 aqueous ammonia, the probability of large numbers  
21 of fatalities.

22           Q     So in your opinion, would you recommend  
23 the use of the steel cylinders over the tank  
24 proposed for this project?

25           A     I would not in this case, nor have we in

1 any other case.

2 Q Could you recommend additional  
3 mitigation measures to reduce the probability in  
4 consequence of an ammonia release?

5 A As I mentioned, the CFA program has a  
6 lot of measures that definitely would be a good  
7 idea. We tend to recommend to many of our clients  
8 that as a standard procedure in their requisition  
9 of these materials, whether it be chlorine or  
10 ammonia, that in their bid process they include  
11 several items that the supplier would have to  
12 comply with. One of them is safe driver measures.  
13 This would include driver training programs, a  
14 well defined hiring policy, drug and alcohol  
15 programs, and what we call VMS, or vehicle  
16 monitoring system, which can monitor the hours  
17 that a truck operates as well as the speeds that  
18 they go.

19 We would suggest that they have a  
20 written vehicle inspection program, with the  
21 requirement that those records are available for  
22 their review. Defined routes based on accident  
23 frequencies, traffic levels and road conditions.  
24 Some of which, for example, CEC staff has  
25 evaluated at least local road conditions.

1           We also suggest site specific driver  
2     training at the delivery point, since that is one  
3     area where you have a potential for a release.  
4     And in some cases, we have clients that actually  
5     require that they have the same driver come to  
6     their facility who is thoroughly familiar with  
7     their procedures.

8           Q     And one last question. Dr. Fox refers  
9     to the ammonia delivery route, stating that  
10    portions of the routes that would be used by the  
11    ammonia tankers are in close proximity to large  
12    numbers of residential, school and business  
13    locations. Do you agree with that assertion?

14          A     No, I don't. The reference to that was  
15    essentially an appendix to the Chevron study that  
16    we prepared. There is no discussion in there of  
17    whether or not there are schools and businesses in  
18    the location of this route. And again, it's 85  
19    percent rural farm, which is a very low  
20    population. The only thing that's lower is what  
21    we call unpopulated, which we didn't have along  
22    this route.

23                Again, by contrast, I think when you  
24    look at the other studies that were included in  
25    her attachments, the Southern California Edison

1 studies, the Unocal and ARCO refinery studies,  
2 these are all areas where you have highly  
3 populated areas, high population densities, and  
4 routes where you cannot avoid facilities or other  
5 areas where you would have concentrations of the  
6 population.

7 MS. LUCKHARDT: Okay. At this point I  
8 would like to offer Applicant's exhibits and  
9 testimony in the area of Traffic and  
10 Transportation into evidence, at this time.

11 HEARING OFFICER WILLIAMS: Objections?

12 MS. REYNOLDS: No.

13 HEARING OFFICER WILLIAMS: Hearing none,  
14 so admitted.

15 (Thereupon, the Traffic and  
16 Transportation sections of Exhibit  
17 1 and Attachment A, and Exhibits  
18 2, 3, 4, 12, 13, and 14, were  
19 received into evidence.)

20 MS. LUCKHARDT: And the witnesses are  
21 available for cross.

22 HEARING OFFICER WILLIAMS: We're going  
23 to take a break, five minute break, come back.

24 Off the record.)

25 (Thereupon, a recess was taken.)

1                   COMMISSIONER MOORE: We are open now for  
2           business, and cross examination of the Applicant's  
3           witnesses on Transportation.  
4                   Staff?

5                   MS. WILLIS: We just had a couple of  
6           questions.

7                   CROSS EXAMINATION

8                   BY MS. WILLIS:

9                   Q     In your experience and based on the  
10          studies that you just discussed earlier --

11                   COMMISSIONER MOORE: Who are you  
12          speaking to?

13                   MS. WILLIS: Mr. Radis. Sorry.

14                   BY MS. WILLIS:

15                   Q     Did you conclude that the risk  
16          associated with current ammonia transportation  
17          practices is unacceptable?

18                   A     Could you -- could you say that again?  
19          I'm not quite sure I get what you're asking.

20                   Q     Well, let me -- let me actually move --  
21          I can ask a different question. It probably -- so  
22          it's a little bit clearer.

23                             In staff's testimony there is opinion  
24          that the established regulatory programs are  
25          effective in addressing the safety of anhydrous

1 ammonia transportation. Do you agree with that  
2 statement?

3 A Generally, yes.

4 Q Is there anything unusual or  
5 extraordinary in this particular case, in  
6 transporting ammonia to this project site, that  
7 would lead you to believe something different?

8 A No.

9 MS. WILLIS: Thank you. That's all I  
10 have.

11 MS. REYNOLDS: Mr. Mudry, I have a  
12 couple of questions for you.

13 CROSS EXAMINATION

14 MS. REYNOLDS: Is aqueous ammonia more  
15 commonly used material than anhydrous?

16 MR. MUDRY: I'm not sure. I believe  
17 that it is much less common -- I'm not sure. I'm  
18 not sure, but I've never seen any statistics. My  
19 impression is that aqueous ammonia is much less  
20 commonly used than aqueous.

21 MS. REYNOLDS: I'm sorry. Did you say

22 --

23 MR. MUDRY: Let's start again. Aqueous  
24 ammonia is much less commonly used than anhydrous.  
25 Sorry.

1 MS. REYNOLDS: Okay.

2 Mr. Radis, is that your opinion, based  
3 on your experience?

4 MR. RADIS: Based on my experience, I  
5 guess one of the difficulties in looking at the  
6 database is that there are very stringent  
7 reporting requirements for anhydrous ammonia --

8 MS. REYNOLDS: I'm sorry, I don't know  
9 if you understood my question. I'm not asking  
10 about the accident probabilities. I'm asking as  
11 far as use, like pounds per year or gallons per  
12 year, is there more aqueous ammonia used than  
13 anhydrous; do you know?

14 MR. RADIS: I'm going to go back to my  
15 same answer. The reporting requirements for  
16 anhydrous ammonia make it much easier to track how  
17 much anhydrous ammonia is used and transported.  
18 Whereas with aqueous ammonia, there are many areas  
19 where the reporting requirements are less  
20 stringent, and it's much more difficult to track  
21 full usage. And so we believe that there is, on a  
22 probably per ton of ammonia basis, more anhydrous  
23 ammonia in use and more anhydrous ammonia  
24 transported. But you can't conclusively determine  
25 that, given the limitations of the databases.

1 MS. REYNOLDS: Okay.

2 Mr. Mudry, do you know what the accident  
3 rate for Elk Hills Road is?

4 MR. MUDRY: The accident rate I believe  
5 is in one of the tables in the AFC. No, I -- I  
6 can't recall offhand, but I believe it's an  
7 average accident for the area.

8 MS. REYNOLDS: But not for Elk Hills  
9 Road in specific?

10 MR. MUDRY: No.

11 MS. REYNOLDS: Do you know if that data  
12 is available anywhere?

13 MR. MUDRY: No, I'm not --

14 MS. REYNOLDS: Mr. Radis, you cited in  
15 your testimony, and you relied several times in  
16 your discussion on a Chevron Gaviota study. Can  
17 you identify that study in particular? Is that --  
18 is the document you relied on entitled Arthur D.  
19 Little, Final Risk Assessment for Ammonia  
20 Transportation to the Chevron Gaviota Facility?

21 MR. RADIS: Yes, it is.

22 MS. REYNOLDS: Is this the document you  
23 relied on?

24 MR. RADIS: It's one of the documents  
25 that I relied on.

1 MS. REYNOLDS: Okay.

2 I would like to have this marked as an  
3 exhibit and entered into the record, since it's  
4 been relied on heavily by Mr. Radis in his  
5 testimony.

6 HEARING OFFICER WILLIAMS: Okay. We'll  
7 mark it as 32.

8 MS. REYNOLDS: I have copies for the  
9 other -- I don't know, you probably don't need  
10 one. They're for your Counsel.

11 (Inaudible asides.)

12 HEARING OFFICER WILLIAMS: Could I have  
13 a copy?

14 We'll mark 32, the Chevron Gaviota  
15 Facility study. Is there any objection to  
16 admission of this document?

17 MS. LUCKHARDT: No objection.

18 HEARING OFFICER WILLIAMS: 32 is  
19 admitted.

20 (Thereupon, Exhibit 32 was marked  
21 for identification and was  
22 received into evidence.)

23 MS. REYNOLDS: Your testimony you -- you  
24 discuss that your analysis looked at the route  
25 from Stockton to the project site, but you don't

1 identify the specific route. Can you identify the  
2 specific roads that you analyzed in your route?

3 MR. RADIS: Basically, the  
4 transportation route is almost entirely Interstate  
5 5. I can't recall the exact percentage, but it  
6 clearly is, I think, more than 90 percent of the  
7 route. I don't recall the exact route, although  
8 there's a couple alternatives that are discussed  
9 in the AFC for the area between I-5 and the site.

10 MS. REYNOLDS: Is it similar to the  
11 route studied in the Chevron Gaviota?

12 MR. RADIS: Yes.

13 MS. REYNOLDS: Up to what point, would  
14 you say?

15 MR. RADIS: Between Stockton and an area  
16 north of the Highway 166 turnoff.

17 MS. REYNOLDS: That's Highway 166?

18 MR. RADIS: I believe that's the number.

19 MS. REYNOLDS: Okay. Has the Applicant  
20 committed to obtaining its ammonia from Stockton?

21 MR. RADIS: I don't believe the  
22 applicant has committed to obtaining it directly  
23 from Stockton. However, it is probably a high  
24 probability that that would occur, given that the  
25 ammonia that would be obtained from the Los

1 Angeles area more than likely would, again,  
2 originate from either Stockton or Sacramento.

3 In work that we did for the South Coast  
4 Air Quality Management District, we determined  
5 that given the amount of ammonia available in the  
6 South Coast Air Basin at the time the SCR units  
7 were proposed, ammonia imports would be required  
8 via train from either Stockton or Sacramento. And  
9 given the additional cost of transporting ammonia  
10 between Stockton and Sacramento down to Los  
11 Angeles, it's not likely that the ammonia would be  
12 then trucked up from Los Angeles, when it probably  
13 would be cheaper to get it from Stockton direct.

14 MS. REYNOLDS: But you don't know.

15 MR. RADIS: I do not know for sure, no.

16 MS. REYNOLDS: Is there anything in  
17 staff's Proposed Conditions of Certification that  
18 restricts the Applicant to obtaining its ammonia  
19 from Stockton or any other location?

20 MR. RADIS: No.

21 MS. REYNOLDS: Is there anything in the  
22 conditions proposed by staff that prohibits the  
23 Applicant from obtaining its ammonia from the LA  
24 Basin?

25 MR. RADIS: No, there's not.

1 MS. REYNOLDS: If the ammonia came from  
2 the LA Basin, would the probability of an accident  
3 be higher than from Stockton?

4 MR. RADIS: The --

5 MS. REYNOLDS: I'm referring to your  
6 weighted average calculation that you did in your  
7 testimony.

8 MR. RADIS: Correct. The -- actually,  
9 the Los Angeles route is shorter, although I  
10 believe some of the accident rates on segments  
11 might be a little bit higher. Having not  
12 evaluated it directly, I'm not a hundred percent  
13 sure if the overall risk would be higher or not.  
14 Again, it would depend on where the ammonia came  
15 from in the Los Angeles area.

16 I do know that on the Chevron study, the  
17 transportation route between Los Angeles and Santa  
18 Barbara was highly populated, given that it goes  
19 through southern Santa Barbara County. In this  
20 case, it would probably go through I-5 and an area  
21 just north of Los Angeles that is relatively low  
22 in population.

23 MS. REYNOLDS: If the ammonia came from  
24 the LA Basin, would a portion of the  
25 transportation route be in a populated -- a highly

1       populated urban area?

2               MR. RADIS:   Small portions, yes.

3               MS. REYNOLDS:  Based on your experience,  
4       are you aware of any hazardous materials  
5       transportation risk analyses that have included  
6       transportation routes beyond the immediate  
7       vicinity of the project?

8               MR. RADIS:  Could you restate that?

9               MS. REYNOLDS:  No.

10              MR. RADIS:  No?  I am not --

11              MS. REYNOLDS:  Oh, I'm sorry.  Can you

12       --

13              MR. RADIS:  Can you restate that?

14              MS. REYNOLDS:  -- I thought you said did  
15       we -- didn't we state that.

16              Based on your experience, are you aware  
17       of any hazardous materials transportation risk  
18       analyses that have included transportation routes,  
19       an analysis of transportation routes beyond the  
20       immediate project vicinity?

21              MR. RADIS:  Related to this project, or

22       --

23              MS. REYNOLDS:  No.  In general.  In your  
24       experience.

25              MR. RADIS:  There are a lot of studies

1 out there that study transportation routes much  
2 further away than the site.

3 MS. REYNOLDS: Is it -- would it be  
4 possible to develop a reasonable analysis of  
5 ammonia transportation risks that cover the entire  
6 transportation route to the project area?

7 MR. RADIS: From where to where?

8 MS. REYNOLDS: Well, if -- if origin  
9 routes were -- or origin locations were  
10 identified, would it be possible to do that?

11 MR. RADIS: Yes.

12 MS. REYNOLDS: Would it be possible to  
13 develop a reasonable analysis of ammonia  
14 transportation risks from, say, Los Angeles to the  
15 project site?

16 MR. RADIS: Yes.

17 MS. REYNOLDS: Could an accident  
18 involving an ammonia truck occur at any point  
19 along the transportation route?

20 MR. RADIS: Yes, it could.

21 MS. REYNOLDS: You discussed several  
22 recommendations you would give the Applicant for  
23 -- to mitigate transportation risks in your  
24 testimony. Has the Applicant committed to  
25 implement these measures?

1 MR. RADIS: Not to my knowledge.

2 MS. REYNOLDS: Are these measures  
3 required by staff's Proposed Conditions of  
4 Certification?

5 MR. RADIS: No, they're not.

6 MS. REYNOLDS: I have no further  
7 questions.

8 HEARING OFFICER WILLIAMS: Is there any  
9 further cross?

10 MS. WILLIS: No.

11 HEARING OFFICER WILLIAMS: I just have  
12 one technical question. Where -- it's not that  
13 technical. Where does the -- what geographical  
14 area does the South Coast Air Quality Management  
15 District cover?

16 MR. RADIS: It covers the area called  
17 the South Coast Air Basin, which -- and covers  
18 most of Los Angeles County, Orange County, and the  
19 portions of San Bernardino and Riverside Counties  
20 that are on the seaward side of the mountain  
21 ranges in the basin.

22 MS. REYNOLDS: It stops about Ventura,  
23 doesn't it, on the northern boundary?

24 MR. RADIS: Correct. The Los  
25 Angeles/Ventura County line is technically the

1 boundary on that side.

2 HEARING OFFICER WILLIAMS: Okay. Thank  
3 you.

4 Staff.

5 MS. WILLIS: Ready to go with our  
6 witnesses? Okay.

7 HEARING OFFICER WILLIAMS: Yes.

8 Do you have exhibits, did we admit --

9 MS. LUCKHARDT: I believe we have moved  
10 our exhibits in prior to the -- allowing cross  
11 examination.

12 HEARING OFFICER WILLIAMS: I would  
13 clarify for the record that we did admit 27D.

14 MS. LUCKHARDT: Okay.

15 HEARING OFFICER WILLIAMS: Which is --  
16 which is sponsored by the Applicant. It's the  
17 Figure 3 --

18 COMMISSIONER MOORE: With the addition  
19 of --

20 HEARING OFFICER WILLIAMS: -- with the  
21 addition of Mr. Rowley's mark, Figure 3.2-2.

22 (Thereupon, Exhibit 26D was  
23 received into evidence.)

24 MS. REYNOLDS: I just want to clarify  
25 also, we did enter 32; correct? You asked if

1 anyone had any objections.

2 HEARING OFFICER WILLIAMS: 32 is in.

3 MS. REYNOLDS: Okay.

4 HEARING OFFICER WILLIAMS: So I think  
5 we're ready to proceed with staff.

6 MS. WILLIS: Thank you. At this time  
7 staff would like to call Eric Knight and Rick  
8 Tyler. And Mr. Knight needs to be sworn in.

9 HEARING OFFICER WILLIAMS: Would you  
10 swear the witness, please.

11 (Thereupon, Eric Knight was, by the  
12 reporter, sworn to tell the truth,  
13 the whole truth, and nothing but the  
14 truth.)

15 TESTIMONY OF

16 ERIC KNIGHT

17 called as a witness on behalf of the Commission  
18 staff, having first been duly sworn, was examined  
19 and testified as follows:

20 DIRECT EXAMINATION

21 BY MS. WILLIS:

22 Q Could you please state your name for the  
23 record?

24 A Eric Knight.

25 Q And did you prepare the section of the

1 Final Staff Assessment entitled Traffic and  
2 Transportation?

3 A Yes, I did.

4 Q And that has previously been identified  
5 as part of Exhibit 19. Did you include in Exhibit  
6 19 a statement of your qualifications?

7 A Yes, I did.

8 Q Do you have any changes or corrections  
9 to your testimony at this time?

10 A Yes, I do.

11 Q And that has been -- for the record,  
12 that has been marked as Exhibit 21-F.

13 With these changes, are the facts  
14 contained in your testimony true and correct?

15 A Yes, they are.

16 Q Do the changes you present today change  
17 any of your conclusions?

18 A No. No, they do not.

19 Q And do the opinions contained in your  
20 testimony represent your best professional  
21 judgment?

22 A Yes.

23 MS. WILLIS: Mr. Tyler, you've already  
24 been sworn.

25 ///

1 TESTIMONY OF

2 RICK TYLER

3 called as a witness on behalf of the Commission  
4 staff, having previously been duly sworn, was  
5 examined and testified further as follows:

6 DIRECT EXAMINATION

7 BY MS. WILLIS:

8 Q Did you prepare the supplement to the  
9 Traffic and Transportation section?

10 A Yes, I did.

11 Q And that will also be part of Exhibit  
12 19, I believe.

13 Do you have any changes or corrections  
14 to your testimony at this time?

15 A Yes, I have two minor changes to make.

16 MS. WILLIS: We don't have those changes  
17 in written form at this time. Is it okay for him  
18 to go ahead and read it, and then we'll provide  
19 those changes tomorrow, or the next session?

20 HEARING OFFICER WILLIAMS: Sure.

21 BY MS. WILLIS:

22 Q Mr. Tyler, could you read us your  
23 changes?

24 A On page 3, about I guess two-thirds of  
25 the way down, starting with the line accidental

1 release for the Stockton route, would be --

2 MR. LUCKHARDT: Mr. Tyler, can you hang  
3 on just a second so we can all get there? I'm  
4 sorry, that was page 3?

5 THE WITNESS: Yes.

6 HEARING OFFICER WILLIAMS: What -- what  
7 are we talking about now? The --

8 MS. WILLIS: This is Mr. Tyler's -- the  
9 supplemental transportation --

10 HEARING OFFICER WILLIAMS: The  
11 supplement. And we've marked the supplement --

12 MS. WILLIS: I believe it would be part  
13 of Exhibit 19, or -- unless you want to give it  
14 another --

15 HEARING OFFICER WILLIAMS: 19? Yeah,  
16 let's mark it separately as 21-H.

17 MS. WILLIS: Okay, 21-H?

18 HEARING OFFICER WILLIAMS: Yeah, that's  
19 where we're putting, I think, all the revisions.

20 (Thereupon, Exhibit 21-G was  
21 marked for identification.)

22 HEARING OFFICER WILLIAMS: And 21-G will  
23 be the revisions -- 21-G will be revisions to  
24 staff Elk Hills Power Project Traffic and  
25 Transportation testimony.

1 MS. WILLIS: I believe we marked that F.

2 HEARING OFFICER WILLIAMS: I have as F  
3 the errata to Haz Mat testimony, submitted by Mr.  
4 Loyer.

5 MS. WILLIS: Okay. So that's G.

6 HEARING OFFICER WILLIAMS: So I think  
7 these two will take us up to H.

8 MS. REYNOLDS: So, I'm sorry, Mr.  
9 Tyler's supplemental testimony was H?

10 HEARING OFFICER WILLIAMS: Yes. And the  
11 revision is G, 21-G. And 21-F was the errata to  
12 the Haz Mat testimony submitted by Mr. Loyer. And  
13 that's on the proposed exhibit list. That's  
14 already typed in.

15 (Thereupon, Exhibit 21-H was  
16 marked for identification.)

17 COMMISSIONER MOORE: Okay.

18 MS. WILLIS: May we proceed?

19 COMMISSIONER MOORE: You certainly may.

20 BY MS. WILLIS:

21 Q Okay. Mr. Tyler.

22 A Okay. On page 3, about two-thirds of  
23 the way down through the second paragraph on the  
24 line starting with "of accidental release for the  
25 Stockton route". The number 2.0 times ten to the

1 negative six should be changed to 3.4 times ten to  
2 the negative five per year. That's a per trip  
3 number and I felt it was misleading, so that  
4 should be changed to 3.4 times ten to the negative  
5 five per year.

6 On the next line the number --

7 HEARING OFFICER WILLIAMS: Mr. Tyler,  
8 I'm sorry. I'm not with you. Let me try to get  
9 there. Could you take me through that one more  
10 time?

11 THE WITNESS: Okay. It's just above --  
12 on page 3 there's a conclusion, a major heading,  
13 conclusion.

14 HEARING OFFICER WILLIAMS: Right.

15 THE WITNESS: And the paragraph just  
16 above that, starting about two-third of the way  
17 down, "of accidental release" --

18 HEARING OFFICER WILLIAMS: Got it.

19 THE WITNESS: -- there's a number 2.0  
20 times ten to the negative six. That should be  
21 changed to 3.4 times ten to the negative five per  
22 year.

23 On the next line, the number 1.25 times  
24 ten to the negative six should be changed to 2.13  
25 times ten to the negative five per year. That

1 reflects the 17 trips.

2 BY MS. WILLIS:

3 Q Mr. Tyler, do the changes you present  
4 today change any of your conclusions?

5 A They do not.

6 Q And with these changes, are the facts  
7 contained in your testimony true and correct?

8 A Yes, they are.

9 Q Do the opinions contained in your  
10 testimony represent your best professional  
11 judgment?

12 A Yes, they do.

13 DIRECT EXAMINATION (Resumed)

14 BY MS. WILLIS:

15 Q Okay. Mr. Knight, if you could please  
16 summarize your testimony?

17 A Sure. After reviewing the traffic  
18 analysis presented in the AFC, and the Applicant's  
19 responses to staff's data requests, and after  
20 consultation with Caltrans and the Kern County  
21 Roads Department, I concluded that except for one  
22 highway segment, construction and operation of the  
23 project would not adversely affect the level of  
24 service on area roadways.

25 Construction traffic -- commute traffic

1 will significantly impact the junction of State  
2 Routes 119 and 99 during peak travel periods.  
3 Level of service will drop from existing D during  
4 the peak hour to E.

5 According to Caltrans, a traffic signal  
6 has already been planned and fully funded for this  
7 junction, therefore Caltrans would not require Elk  
8 Hills to fund any improvements. However, it is  
9 not known when this signal will be constructed,  
10 therefore Caltrans recommends that Elk Hills  
11 provide traffic control in the form of a flagman  
12 or policeman during peak travel periods at this  
13 junction. This condition has been proposed by  
14 staff as Trans 6.

15 The staff's Conditions of Certification,  
16 specifically Trans 2 and 4, staff does not  
17 anticipate construction of the project linear  
18 facilities will have any significant impact on  
19 level of service at local roadways or state  
20 highways in the project area, nor will the project  
21 contribute substantially to any cumulative traffic  
22 impacts.

23 On October 8th, 1999, I talked with Mr.  
24 Barry Hayslett of the Kern County Roads  
25 Department, who stated that the access road

1 proposed in the AFC which would have been located  
2 about 1,100 feet north of the intersection of Elk  
3 Hills Road and Skyline Road would not be  
4 acceptable to the Roads Department, since it had a  
5 potential to create a traffic hazard. Mr.  
6 Hayslett suggested the Applicant use the existing  
7 oilfield access road at Skyline Road. The  
8 Applicant met with the county and worked out an  
9 agreeable compromise, as stated in the county's  
10 November 9th, 1999 letter to staff.

11 The primary access road to the power  
12 plant will be at Skyline Road. During  
13 construction a temporary access road located about  
14 600 north of Skyline will be used for receiving  
15 heavy and/or oversize equipment only. To ensure  
16 safety to motorists traveling on Elk Hills Road,  
17 the Applicant will post signs and flagmen which  
18 will be equipped with radios to slow down traffic  
19 during deliveries. These requirements are  
20 included in staff's Proposed Conditions Trans 7  
21 and 8.

22 On the topic of Hazardous Materials, the  
23 Applicant identified several potential routes for  
24 delivery of anhydrous ammonia for the project  
25 site. Those routes are from Interstate 5 north of

1 the site, using State Route 43 south to State  
2 Route 119 west to Elk Hills Road, and then  
3 proceeding north to the site. From I-5 south of  
4 the site, transporters would use SR119 west to Elk  
5 Hills Road.

6 The anticipated route from Bakersfield  
7 is State Route 58 west to SR 43 south to SR 119  
8 west to Elk Hills Road.

9 Staff spoke with the CHP, who stated  
10 that none of these routes are restricted from use  
11 for hazardous materials transportation. Staff  
12 visually inspected these roadways and didn't  
13 identify any unusual traffic hazards. For  
14 instance, at grade railroad crossings on SR 43 and  
15 SR 119 are equipped with active controls.

16 Staff also spoke with Caltrans as to  
17 route specific roadway segments that were  
18 identified in the AFC with higher than statewide  
19 average accident rates. They sent a review of the  
20 type of accidents occurring at these  
21 intersections. Caltrans has determined that these  
22 facilities are properly designed and no changes  
23 are necessary.

24 Absent identification of any unusual  
25 traffic safety hazards, staff concludes that the

1 federal and state regulations established to  
2 regulate the transportation of hazardous materials  
3 are sufficient to mitigate any impacts to less  
4 than significance.

5 Hazardous materials transportation  
6 standards include specific licensing requirements.  
7 Transporters are required to have a commercial  
8 license with a hazardous materials endorsement.  
9 Vehicle Code Section 31303(b) states, quote,  
10 Unless restricted or prohibited, the  
11 transportation of hazardous materials shall be on  
12 state or interstate highways which offer the least  
13 overall transit time whenever practical.

14 Section 31303(b) requires transporters  
15 to avoid, whenever possible, congested  
16 thoroughfares, places where crowds are assembled,  
17 and residential districts.

18 Transporters are also required to carry  
19 shipment papers available for inspection by CHP.  
20 They're required to conduct periodic brake, tire,  
21 and other safety inspections, and maintain records  
22 of those inspections. There's requirements on  
23 maximum permitted driving time within any single  
24 work period. And they're required to take first-  
25 aid instruction and procedures for handling

1 spills.

2 The Applicant has stated its intent to  
3 comply with all federal and state standards for  
4 the transportation of hazardous materials. The  
5 staff has proposed condition Trans 3 to ensure  
6 compliance.

7 Q Mr. Knight, could you briefly explain  
8 the changes you proposed in Exhibit 21-G?

9 A Sure. The original -- the FSA had -- on  
10 page 124, paragraph 1 at the top of that page,  
11 there is -- there is a sentence that stated that  
12 state highways along these routes have been  
13 approved by the CHP for use in transportation of  
14 inhalation related hazardous materials. That  
15 change now reads, the California Highway Patrol  
16 does not restrict transporters of anhydrous  
17 ammonia from using the state highways along these  
18 routes.

19 Staff talked to CHP Officer Nick Griggs,  
20 who stated to staff that only I-5 and 166 have  
21 been approved for transportation of inhalation  
22 hazards, although talking further with CHP another  
23 representative stated that although anhydrous  
24 ammonia is an inhalation hazards, it's -- it's not  
25 restricted to those approved routes. It's treated

1 as if it's a general hazardous material, and may  
2 be transported on any state or interstate highway  
3 unless restricted or prohibited. And none of  
4 these routes have been restricted or prohibited.

5 And in number 2, referenced specifically  
6 to a section, section 32105 and the division. I  
7 think it's Division 14.3 of the Vehicle Code,  
8 which is the chapter on inhalation hazards. So I  
9 replaced that with the section from Section 3103,  
10 which actually governs the transportation of  
11 anhydrous ammonia.

12 And in -- the third change is just  
13 changing the references to reflect my -- my recent  
14 conversation with CHP the other day.

15 Q Mr. Knight, did you review Dr. Fox's  
16 testimony on transportation of anhydrous ammonia?

17 A Yes, I did.

18 Q On page 1 of Dr. Fox's testimony she  
19 states that portions of the routes that would be  
20 used by the ammonia tankers are in close proximity  
21 to large number of residential, school and  
22 business locations. Did you travel the routes in  
23 the area that would possibly be used for the  
24 transportation of ammonia?

25 A Yes, I did.

1           Q     And did you notice large areas of homes,  
2                 schools or businesses?

3           A     The only area that I could say had any  
4                 significant development, or any development of  
5                 any kind of significance, was along Highway 58,  
6                 outside of Bakersfield, and it actually may have  
7                 been on the city limits of Bakersfield, I'm not  
8                 sure. But there's a section of Highway 58 with  
9                 business and industrial development, and some  
10                limited residential.

11          Q     Are there routes other than Highway 58  
12                 that could be used to travel to the project site?

13          A     Yes, there are.

14          Q     On page 2, Dr. Fox mentions reportable  
15                 accident rates on MPR 1, and I think the Applicant  
16                 has already addressed that.

17                When you did your analysis, which roads  
18                 did you consider?

19          A     For local roads, the only local road,  
20                 County 19 road, that's affected by the  
21                 transportation of hazardous materials is Elk Hills  
22                 Road.

23          Q     And do you have information regarding  
24                 accidents on Elk Hills Road?

25          A     Yes, I do. I talked to Mr. Barry

1 Hayslett, Kern County Roads Department, who  
2 informed staff that in 1997 there were a total of  
3 two accidents on Elk Hills Road. None of these  
4 involved heavy trucks. In 1998, there were 11  
5 accidents in total. Three of those involved heavy  
6 trucks. Those that involved heavy trucks, there  
7 was only one reported injury, and these accidents  
8 had occurred about 1.3 miles north of Skyline  
9 Road.

10 A non-injury accident involving a heavy  
11 truck occurred at Elk Hills Road and Skyline Road  
12 when a trailer turned over. And at the time when  
13 I talked to him, this was October 8th of 1999,  
14 there had been no accidents on Elk Hills Road.

15 Q On page 3 of Dr. Fox's testimony she  
16 claims that staff's analysis is limited in scope.  
17 How did you determine the scope of your analysis?

18 A I determined, since I-5 is used  
19 continuously by commercial trucks, I would limit  
20 my analysis to those highways that a transporter  
21 would have to use once exiting the interstate to  
22 reach the project site. So that's either State  
23 Route 43, 58, or 119.

24 Q Dr. Fox also discussed the use of rural  
25 roads. In your professional opinion should rural

1 roads be used?

2 A Well, I refer to the -- the sections in  
3 the Vehicle Code which require -- which require  
4 transporters to avoid heavily congested areas, but  
5 also choose the route that will offer the overall  
6 least transit time. And I don't know what rural  
7 roads she's referring to, but it's possible that  
8 it can increase the overall transit time.

9 MS. WILLIS: Thank you.

10 DIRECT EXAMINATION (Resumed)

11 BY MS. WILLIS:

12 Q Mr. Tyler, would you please summarize  
13 your supplemental testimony?

14 A Yes. First, I think the point I'd like  
15 to make most strongly is that staff doesn't think  
16 that it's generally appropriate to do this type of  
17 analysis for transportation of anhydrous ammonia  
18 to facilities. For the -- the first reason is  
19 that we believe strongly that there's an existing  
20 regulatory program that's effective and extensive,  
21 and that that program provides reasonable  
22 assurances that the public is protected.

23 In fact, anhydrous ammonia is one of  
24 the top three most frequently transported  
25 materials in the United States. It's produced in

1 -- in millions of tons per year. It's widely  
2 transported, and is widely -- that transportation  
3 regulation -- regulatory program is widely  
4 accepted as -- as reasonable.

5           Secondly, we believe that it would take  
6 a unreasonable level of speculation to do an  
7 analysis of the transportation routes, and that's  
8 because we believe that any accurate analysis  
9 would have to reflect the distribution ammonia  
10 from the point of supply, or primary supply or  
11 manufacturer, all the way to the point of end use.  
12 It's our contention that for many reasons,  
13 economic and otherwise, there could be significant  
14 changes in how ammonia ultimately gets from its  
15 manufacturing point to an end user over the 30  
16 year life of the project.

17           I don't believe that, therefore, that  
18 the analysis could be done in a manner that would  
19 be accurate. It would also be extremely difficult  
20 to reflect all the factors. It would require  
21 actual dividing up the road into small segments so  
22 that you could actually evaluate the probabilities  
23 of wind directions, wind speeds and prevailing  
24 meteorological conditions, as well as accident  
25 rates. And as well as population densities along

1 all of the potential routes over the -- that might  
2 be used over the 30 year period.

3 Therefore, we believe that -- that any  
4 attempt to do this would require an unreasonable  
5 degree of speculation.

6 Aside from that, I did do -- make an  
7 attempt to do an analysis similar to that that was  
8 done by CURE, and I found actually a accident rate  
9 -- I did not like the line on the -- on the tank  
10 trips per year, and I found that to be difficult  
11 to try to quantify and understand. So I used an  
12 actual number from Lees' book that is specifically  
13 provided to address ammonia transportation,  
14 reflect the type of vehicles that would be used  
15 for ammonia transportation.

16 That number's significantly lower than  
17 any of the other numbers in terms of probability  
18 than -- than I've seen. That's 8.1 times ten to  
19 the negative ninth per tanker mile. Accidental  
20 releases per tanker mile.

21 I then used that and used the two routes  
22 that were defined for this, as well as the Sunrise  
23 Project -- they're similar -- and -- and the three  
24 weeks and 17 deliveries to derive a accident  
25 probability. Again, that is slightly over ten to

1 the negative fifth per year, which is well within  
2 the guidelines, and -- and there's nothing  
3 extraordinary here that would suggest that this  
4 risk is -- is higher than typically associated  
5 with ammonia transportation throughout the entire  
6 United States.

7 With regard to the proposed Conditions  
8 of Certification by CURE, I don't believe that  
9 there -- that restricting routes to the 50 mile  
10 radius is appropriate. In fact, it may even  
11 increase risk. And the reason is obviously if we  
12 take -- if there was -- if the supplier in  
13 Bakersfield did buy from the LA Basin as opposed  
14 to Stockton, it would come through a more  
15 populated area. Additionally, the transportation  
16 route would require to go to Bakersfield and then  
17 back to the project.

18 So that -- that points out some of the  
19 -- some of the uncertainties and questions about  
20 doing this type of analysis that -- that haven't  
21 been adequately addressed in CURE's analysis. So  
22 if that were to occur, it would actually increase  
23 the risk of -- of public exposure.

24 One that's particularly troubling is the  
25 condition that would -- would suggest that these

1       should only occur at night. In fact, while it may  
2       reduce -- slightly reduce the probability of an  
3       accident involving the tanker truck, it would also  
4       significantly increase the probability that  
5       instability in one meter per second wind speeds  
6       would be present, because nighttime conditions are  
7       when those are prevalent.

8               So, and additionally, it would also, in  
9       my opinion, significantly impede any attempt for  
10      emergency rescue, because of people sleeping and  
11      so on. It -- in my opinion, it's an ill-advised  
12      course of action.

13             And with that, I guess that pretty much  
14      covers --

15             Q     I just had one question. And maybe you  
16      could just clarify, briefly discuss the use of  
17      aqueous ammonia.

18             A     Yeah. The use of aqueous ammonia, I  
19      don't -- I don't believe is necessary in this  
20      instance. And in fact, as was discussed earlier,  
21      aqueous ammonia transportation is not without  
22      risk, and in terms of the transportation  
23      environment the -- the lesser standards that are  
24      applicable to -- as a matter of fact, I really  
25      can't even define what the standards are. I've

1 even had assertions which may be true that we  
2 could simply have a fiberglass tank on the back of  
3 a flatbed truck and deliver aqueous ammonia.

4 Under those circumstances, if we have an  
5 accident with that type of vehicle, or a lesser  
6 vehicle than the ones that are being used for  
7 anhydrous ammonia, we would have a much higher  
8 probability of release of that material in any  
9 accident scenario. And along I-5 on hot pavement,  
10 with a heavily trafficked route like that, we  
11 would have significant concentrations of ammonia  
12 immediately above the pool. And we're also  
13 potentially increasing trading the risks of worker  
14 impacts for public impacts, which may be  
15 appropriate in a highly populated area, but not  
16 necessarily for this project.

17 Q Does that conclude your testimony?

18 A Yes, it does.

19 MS. WILLIS: At this time staff would  
20 like to move the section of the Final Staff  
21 Assessment entitled Traffic and Transportation  
22 into the record as part of Exhibit 19, and Mr.  
23 Tyler's Supplemental Testimony and Mr. Knight's  
24 changes.

25 HEARING OFFICER WILLIAMS: Any

1 objections?

2 MS. LUCKHARDT: No objection.

3 MS. REYNOLDS: No.

4 HEARING OFFICER WILLIAMS: So admitted.

5 (Thereupon, the Traffic and  
6 Transportation section of Exhibit 19,  
7 and Exhibits 21-G and 21-H were  
8 received into evidence.)

9 MS. WILLIS: And these witnesses are  
10 available for cross examination.

11 MS. LUCKHARDT: No questions.

12 MS. REYNOLDS: I have a few.

13 CROSS EXAMINATION

14 BY MS. REYNOLDS:

15 Q Mr. Tyler, you stated -- you just stated  
16 that anhydrous ammonia is one of the top three  
17 materials transported. What's the universe of  
18 materials you're talking about, hazardous  
19 materials, all materials including sugar -- I'm  
20 trying to figure out what you mean.

21 A I'm talking about hazardous materials.  
22 The top three are chlorine, ammonia, and sulfuric  
23 acid.

24 Q Okay. And what's your --

25 A Oh, I'm sorry.

1           Q     What's your -- where did you find that  
2     information?

3           A     I can't recall exactly where I saw it,  
4     but I've seen it several times that those are the  
5     top three industrial use transported chemicals.

6           Q     You stated that -- with regard to Dr.  
7     Fox's suggestion that aqueous ammonia be used to  
8     mitigate the transportation -- you stated that the  
9     standards for transporting aqueous ammonia are  
10    much more lax, and so that could actually increase  
11    the risk. I seem to recall being involved -- I  
12    was involved in the High Desert case, and I seem  
13    to recall staff relying on LORS in that case to  
14    find no significant risks of transportation  
15    impacts.

16           So I'm curious as to in other siting  
17    decisions where a project's using aqueous ammonia,  
18    you seem to be relying on LORS to adequately  
19    mitigate impacts, but now you're claiming that  
20    they're not good enough. Can you address that?

21           A     I -- I didn't deal with the  
22    transportation testimony in the High Desert case.  
23    I dealt with the aqueous ammonia handling, or  
24    indirectly dealt with that as far as the handling  
25    of it at the power plant.

1                   And again, I think -- I think that --

2                   MS. LUCKHARDT: Do we have a decision in  
3 the High Desert case?

4                   MS. REYNOLDS: There's a proposed  
5 decision. I'm not offering this as evidence. I'm  
6 using this as --

7                   HEARING OFFICER WILLIAMS: Well, let's  
8 -- there has been no objection yet. Is there an  
9 objection?

10                  MS. LUCKHARDT: There's a proposed  
11 decision. Okay.

12                  THE WITNESS: I would say that in  
13 general, my take on it would be to look at the  
14 situation that's -- that's created in terms of  
15 potential exposure of surrounding populations from  
16 the storage, as compared to the risk from  
17 transportation.

18                  In highly populated areas, I believe  
19 that in a densely populated area near a facility,  
20 aqueous ammonia is probably the option that should  
21 be undertaken. But absent that, I think that --  
22 that use of anhydrous ammonia would be potentially  
23 the more appropriate course of action.

24                  So I -- I don't know if that answers  
25 you. I hope that answers your question. I'm

1       having a little trouble.

2               BY MS. REYNOLDS:

3               Q     What is your recommended significance  
4       standard for ammonia transportation accidents in  
5       this case?

6               A     We didn't -- as I stated earlier, we did  
7       not and do not advocate doing this type of  
8       analysis, period. We believe that the existing  
9       regulatory program is sufficient for us to rely  
10      on.

11              Again, when I calculate the risks, and  
12      based on -- on the analyses I've seen, the risks  
13      suggest that these are readily acceptable -- the  
14      typical risks associated with ammonia, in the  
15      absence of some very specific concern in terms of  
16      population density or particular hazards unique to  
17      a facility, that in general ammonia handling is  
18      adequate and is widely accepted as appropriate.

19              Q     So -- okay. So is your -- is your  
20      finding of lack of significant impact based on the  
21      commonality of ammonia transport rather than --  
22      than, say, a probability -- a certain probability,  
23      or something more quantitative?

24              A     The probability that -- that -- the  
25      estimate that I made suggests to me that this is

1 not an unreasonable activity. Furthermore, there  
2 -- it's commonly accepted throughout the United  
3 States, and is widely done. So what I'm saying is  
4 that when I look at the number of fatalities per  
5 year, or I look at the number of accidents and  
6 serious consequences associated with handling this  
7 material, I don't see any reason to believe that  
8 in general transportation of ammonia is  
9 unacceptable.

10 Further, I find no extraordinary  
11 circumstances or hazards associated with this  
12 project that would make me second-guess that  
13 program.

14 Q So you don't have a numerical --

15 A No. No.

16 Q -- significance standard.

17 A No. We -- only recommendations.

18 CROSS EXAMINATION

19 BY MS. REYNOLDS:

20 Q Mr. Knight, are there any restrictions  
21 on ammonia transportation routes in your Proposed  
22 Conditions of Certification?

23 A No, there's not.

24 Q In light of this fact, could the  
25 project's ammonia trucks go through urbanized

1 areas with schools and other sensitive receptors  
2 nearby?

3 A The -- well, the section of the Vehicle  
4 Code that I -- that I cited earlier stated that  
5 unless transporters are required to avoid places  
6 where crowds are assembled, residential districts,  
7 congested thoroughfares whenever possible, they  
8 are not restricted from using those routes if  
9 there is no other alternative to reach a pick-up  
10 or delivery site.

11 Q So is your answer to my question --

12 A But it --

13 Q -- yes? Do you want me to restate it?

14 A Yes, please.

15 Q Could the project's ammonia trucks go  
16 through urbanized areas with schools and other  
17 sensitive receptors?

18 A Theoretically, yes, they could.

19 Q In reality, could -- could they?

20 A Yes, but in this particular case, in the  
21 project area I don't think you have significant  
22 areas of residential -- residential areas,  
23 schools.

24 Q If the project gets its ammonia from LA  
25 or any other urban area, could it --

1 A It --

2 Q -- possibly --

3 A -- it could. Yes.

4 CROSS EXAMINATION (Resumed)

5 BY MS. REYNOLDS:

6 Q Mr. Tyler, in your supplemental  
7 testimony, you cited an ammonia tanker release  
8 frequency of 8.1 times ten to the minus 9. I  
9 believe that's in Exhibit 21-H. Can you -- and  
10 you cited Lees. Could you give us a specific page  
11 and table reference for the number?

12 A It's actually in the text in that book.  
13 I don't -- I can't -- I don't happen to have the  
14 very one here.

15 Q I have them all.

16 A You have all three of them? It's on the  
17 section on Transportation Risks, but I'd have to  
18 look it up.

19 MS. REYNOLDS: Can we take a moment to  
20 do that?

21 COMMISSIONER MOORE: Certainly.

22 (Inaudible asides.)

23 BY MS. REYNOLDS:

24 Q Is there just a chapter entitled  
25 Transportation?

1           A     Yeah, I think so. It's in the -- it's  
2     in the section on Transportation, I believe.

3           COMMISSIONER MOORE: The point of your  
4     question, Counsel, is?

5           MS. REYNOLDS: We can't find out where  
6     this number came from, so we don't know how to  
7     deal with it. Yeah, I mean, there's three  
8     volumes, and we've -- we've looked in the places  
9     we think it might be in, and we can't find it. So  
10    I'm just searching for --

11           (Inaudible asides.)

12          HEARING OFFICER WILLIAMS: Counsel,  
13     where is the reference that -- the reference that  
14     you're looking --

15          MS. REYNOLDS: It's on page 3 of Mr.  
16     Tyler's -- of 21-H, Mr. Tyler's supplemental  
17     testimony, and, you know, the numbers that we  
18     changed earlier, it's about six lines above that,  
19     8.1 times 10 to the minus 9.

20          HEARING OFFICER WILLIAMS: Right.

21          DR. FOX: If I may chime in and help?  
22     I'm looking in the index, and under Transportation  
23     in the index, of ammonia, it cites Chapter 23,  
24     page 6, page 25, page 28 through 29, page 36  
25     through 37 --

1 THE WITNESS: We'll have to go to --

2 MS. REYNOLDS: Chapter 23.

3 DR. FOX: Twenty-three.

4 THE WITNESS: Page what, 6?

5 MS. REYNOLDS: There's several

6 references.

7 THE WITNESS: That's not it.

8 MS. REYNOLDS: Twenty-five?

9 THE WITNESS: Twenty-five? Chapter 25?

10 MS. REYNOLDS: No. They're all --

11 they're all in Chapter 23.

12 THE WITNESS: Twenty-three what?

13 MS. REYNOLDS: Page 25.

14 THE WITNESS: Page 25.

15 HEARING OFFICER WILLIAMS: While he's  
16 searching, Commissioner Moore has to make a phone  
17 call. Do you all want to proceed, or do you want  
18 to wait?

19 THE WITNESS: Chapter 23, I have -- no,  
20 it's Appendix 23. I'm sorry.

21 MS. REYNOLDS: I don't think we need him  
22 here while we're looking.

23 (Inaudible asides.)

24 HEARING OFFICER WILLIAMS: Let's go off  
25 the record. We're going to go off the record.

1 (Off the record.)

2 HEARING OFFICER WILLIAMS: All parties  
3 who were present at the break are again present.

4 Mr. Tyler has found his reference.

5 BY MS. REYNOLDS:

6 Q Yeah. Mr. Tyler, could you, I guess,  
7 give us that reference on the record?

8 A It's Frank Lees' Volume, I believe, 2,  
9 Chapter 23, and page 28 under Transport. And it's  
10 Section 23.6.6, releases for hazardous materials.

11 MS. REYNOLDS: Could we -- is there any  
12 way to -- that you could take official notice of  
13 these two pages, or should we enter these two  
14 pages in the record?

15 COMMISSIONER MOORE: I think by  
16 reference, and -- and by having the -- the  
17 citation is good enough. I mean, we do have  
18 copies of these, so it seems to me that a citation  
19 is adequate.

20 MS. REYNOLDS: Okay. I'd like to cite  
21 both pages 23-27, and 28, because that would  
22 encompass the whole little section that would  
23 cover the -- the referenced material.

24 BY MS. REYNOLDS:

25 Q Mr. Tyler, this reference seems to apply

1       only to puncture incidents. I'll read just a bit.  
2       From an ICI analysis of --

3               MS. LUCKHARDT: Is Counsel testifying?

4               MS. REYNOLDS: No, I -- I'm asking --  
5       this is a preface to a question. This is the  
6       first time we've seen this reference.

7               HEARING OFFICER WILLIAMS: Well, we have  
8       taken official notice of it, so it's in the  
9       record.

10              MS. REYNOLDS: However, from an ICI  
11       analysis of U.S. data showing 12 LPG puncture  
12       incidents, the frequency of spills due to puncture  
13       of U.S. LPG tankers was estimated at --

14              COMMISSIONER MOORE: Well, wait. What's  
15       your question, Counsel?

16              BY MS. REYNOLDS:

17              Q     I -- my question is, this seems really  
18       only to puncture incidents. Is that the only type  
19       of incident that could happen here?

20              A     I don't think it does. I -- I read the  
21       entirety of that section to say basically that  
22       they were comparing the analysis of -- of  
23       similarly designed high-strength pressure vessel  
24       type trucks, and they did it by analogy to  
25       accidents involving LPG and other trucks of

1 similar nature.

2 So I -- I made a distinction based on  
3 what I read there, that's my overall  
4 interpretation of it is that basically they're  
5 saying that that's the -- a representative number  
6 for -- for that type of truck, for that specific  
7 type of truck with a high strength, high integrity  
8 type of vessel.

9 And I didn't read it to mean just --  
10 just -- that was their overall probability of  
11 release, and it's -- the section's titled  
12 "Releases".

13 Q Can you tell us -- you've made a couple  
14 of revisions to your Page 3, about the frequency  
15 of accidental release from Stockton would be --  
16 you changed that to 3.4 times 10 to the minus 5.  
17 Can you explain how you got that?

18 A Yeah. The -- the probability I had  
19 previously, and it wasn't defined either in terms  
20 of units, was for each trip. And that isn't what  
21 I've used in terms -- I wanted to make sure that  
22 -- that my units, that there was comparable to the  
23 UK study that we've all referenced about risk  
24 ranges that are acceptable, between 10 to the  
25 negative fourth and 10 to the negative sixth.

1                   So I wanted to put it in common unit  
2           with that, so I incorporated the 17 deliveries per  
3           year. It wasn't clear from the testimony what I  
4           was talking about, so I wanted to make it very  
5           clear.

6           Q       So is that a simple multiplication --

7           A       That's right. The 17 times -- 17 times  
8           both of the numbers. Which constitutes the number  
9           of deliveries per year. The other one was  
10          previously per -- per delivery.

11                   MS. REYNOLDS: Okay. Those are all the  
12          questions I have.

13                   HEARING OFFICER WILLIAMS: Okay.  
14          Anything further of these witnesses?

15                   Okay. I think we're prepared to move on  
16          to CURE, your presentation.

17                   Did we get the documents in that -- I  
18          think we did.

19                   MS. WILLIS: I believe we did.

20                               TESTIMONY OF

21                               DR. PHYLLIS FOX

22          called as a witness on behalf of CURE, having  
23          previously been duly sworn, was examined and  
24          testified further as follows:

25          ///

1 DIRECT EXAMINATION

2 BY MS. REYNOLDS:

3 Q Dr. Fox, you previously -- we previously  
4 entered your testimony on Hazardous Materials  
5 Management and Traffic and Transportation Impacts  
6 as Exhibit 30. Does that testimony also represent  
7 your sworn testimony for the project's  
8 Transportation Impacts?

9 A It does.

10 Q Are your -- can you briefly state your  
11 qualifications in this area?

12 A I have done a large number of  
13 transportation risk analyses involving ammonia,  
14 chlorine, LPG and other hazardous materials.

15 Q Can you briefly summarize your  
16 testimony?

17 A Yes. The Traffic and Transportation  
18 section of the FSA does not include a traffic  
19 analysis, accident involving the ammonia tankers.  
20 The only analysis that's done in staff's FSA is a  
21 visual inspection of the segments of the route in  
22 the immediately surrounding vicinity of the  
23 project site. They don't do any consequence  
24 analysis to determine the consequences of an  
25 accident involving the ammonia tanker, and they

1       don't present any probability analysis of the  
2       likelihood that such an event would occur.

3               The only analysis in the FSA was a  
4       visual observation of the roads immediately  
5       surrounding the project site. And I did not feel  
6       like that was adequate, because the ammonia in  
7       this case is being brought in over a long  
8       distance. And I still, as I sit here, am not sure  
9       where the ammonia for this project would come  
10      from. We've heard a lot of talk about Stockton,  
11      but there aren't any certification conditions that  
12      require that it come from Stockton, or that it  
13      come from Sacramento, or that it come from the  
14      South Coast, or that it come from Bakersfield.

15             I mean, there -- there basically are no  
16      conditions that require any particular point of  
17      delivery or any route. So I felt it was  
18      appropriate to do an analysis to see whether or  
19      not one route as opposed to another would have a  
20      lower probability of resulting in an accident, and  
21      a lower consequence if that accident occurred.

22             And what I did was I took the analysis  
23      that was prepared for the Sunrise case, and in the  
24      Sunrise case the Applicant used the FEMA screening  
25      guidelines that Mr. Radis testified that A.D.

1 Little had actually prepared. I applied those  
2 screening guidelines, together with the Sunrise  
3 analysis, to come up with a probability of an  
4 accident for this case. And I also used the  
5 Sunrise Applicant's consequence analysis. And I  
6 concluded that the risk was significant.

7 Q What is your opinion of staff's claim  
8 that conducting an analysis of the entire ammonia  
9 transportation route is too speculative?

10 A I don't believe it is speculative.  
11 There are only two major routes of entry of  
12 ammonia in California, as I discussed earlier in  
13 the day. Most of the ammonia, anhydrous ammonia  
14 used in California comes in by ship. There's not  
15 much anhydrous ammonia produced within the state  
16 because of the environmental regulations in  
17 California, so most of it comes from Washington  
18 state, Alaska, and other points. And it comes  
19 down by ship. and it enters California at --  
20 through the Port of Sacramento, the Port of  
21 Stockton, and the Port of Long Beach on the South  
22 Coast.

23 Q Is it -- is it feasible to analyze  
24 transportation impacts for those routes?

25 A Right. You basically have two major

1 sources of the ammonia, the South Coast and the  
2 northern part of the state, in the  
3 Sacramento/Stockton area. And there are a limited  
4 number of routes that one could take out of either  
5 one of those areas to get to the plant site. And  
6 the various routes have different accident  
7 probabilities associated with them.

8 The route from Stockton would have a  
9 much lower probability of an accident than the  
10 route through the South Coast, obviously. So it  
11 -- it's not speculative. It would be very easy to  
12 do. It was done in the case of the Chevron  
13 Gaviota study, it was done in the case of the LNG  
14 study that's included in my -- my testimony, and  
15 it's been done in lots of other studies, as you  
16 heard Mr. Radis mention.

17 Q Mr. Mudry talked about database  
18 problems, and suggested that the -- one database  
19 was preferable to the other. Can you discuss  
20 those database issues?

21 A Yes. There's two databases. One of them  
22 is the HMIS database, which Mr. Mudry discussed,  
23 and the other one is the National Response Center  
24 database, which is operated by the U.S. Coast  
25 Guard.

1           Both of those databases have problems.  
2       Neither one of them is perfect. And if you take  
3       any slice of time out of both of those databases  
4       and compare them, you'll find it's apples and  
5       oranges. In fact, there's a major problem with  
6       reporting in both of the databases, and anywhere  
7       from 50 to 80 percent of the accidents typically  
8       go unreported.

9           And, in fact, the HMIS database which  
10      Mr. Mudry was talking about, up until very  
11      recently was only used for interstate accidents,  
12      accidents involving interstate carriers. And I  
13      have not relied on that database in this case  
14      because most of the ammonia in California is  
15      intrastate carriers. However, I have not looked  
16      at the frequency of aqueous ammonia accidents in  
17      the HMIS database, so I can't comment on that as I  
18      sit here.

19           But both of those databases have -- have  
20      significant problems, and I'd actually like to  
21      read to you a bit from this book that all the  
22      parties keep pulling out, Guidelines for Chemical  
23      Transportation Risk Analysis, the AICHE book, on  
24      page 114. It talks about the problems with these  
25      databases.

1                   Several studies by the Office of  
2           Technology Assessment, by Quanta Analytics, and by  
3           Midwest --

4                   HEARING OFFICER WILLIAMS:   Excuse me.  
5           Dr. -- I'm sorry, to cut you off.   Could you just  
6           designate which page you're reading from?

7                   THE WITNESS:   I am --

8                   COMMISSIONER MOORE:   She said 114.

9                   THE WITNESS:   I am on page 114.   And I  
10          am reading from the third complete paragraph on  
11          that page.

12                   Several studies by the Office of  
13          Technology Assessment, by Quanta Analytics, and by  
14          Midwest Research Institute, have raised concerns  
15          about the under-reporting biases of the HMIS  
16          database, and of other databases, as well.   The  
17          databases assembled by HMIS from voluntary reports  
18          of truck incidences by interstate motor carrier  
19          firms, intrastate carriers are exempt from  
20          reporting.   The degree of under-reporting is, of  
21          course, uncertain.   The MRI report cited several  
22          comments on under-reporting found in other  
23          sources.

24                   And some of the bulleted items that  
25          follow.   A Department of Transportation source

1 estimated that 20 percent of all accidents are  
2 reported. And a comparison of HMIS data and a  
3 hazardous spill database developed by the Bureau  
4 of Motor Carrier Safety of the Federal Highway  
5 Administration indicate that about one-half of the  
6 spill accidents in each database is missing from  
7 the other database.

8 So it's very treacherous to rely on  
9 either one of these databases.

10 BY MS. REYNOLDS:

11 Q Dr. Fox, if there were an accident  
12 involving anhydrous ammonia, what would the  
13 concentrations be and how far would they -- they  
14 -- you've mentioned that your analysis in your  
15 testimony, on page 6 --

16 A In my testimony on page 6, based on the  
17 analysis that the Sunrise Applicant did, the  
18 benchmark concentration of 75 ppm would extend out  
19 5.95 miles from the point of the accident.

20 Q Dr. Fox, there was discussion during the  
21 Applicant's and staff's testimony about urban  
22 versus rural risks, and that due to the rural  
23 location of the project risks would be lower. Can  
24 you address that?

25 A Yes, with some patience of the parties,

1 I can. I believe that Mr. Radis referred to a  
2 table that I refer to in my testimony, which is in  
3 the transportation bible, Guidelines for Chemical  
4 Transportation Risk Analysis, Table 2-7 on page  
5 80. And what -- what that is is it's truck  
6 accident rates for California, Illinois, and  
7 Michigan. And it reports accident rates and  
8 release probabilities for different kinds of roads  
9 in rural areas and in urban areas.

10 And the point that Mr. Radis made was  
11 that the accident rate is higher in urban areas  
12 than it is in rural areas. However, he went on to  
13 testify that the probability of a release was  
14 smaller in the rural area than it is in the urban  
15 area, and suggested that in fact, if you  
16 multiplied the accident probability by the release  
17 probability together, you would find that in the  
18 rural areas the probability of an accident  
19 resulting in a release would be lower for the  
20 rural areas than for the urban areas.

21 And in fact, that's not true. While Mr.  
22 Radis was talking I was sitting here busily  
23 calculating. And when you make those  
24 calculations, what you find is the urban -- in  
25 urban areas the probability of an accident

1 involving a release is always higher than in rural  
2 areas.

3 Q And why do you think it's relevant to  
4 consider urban areas in this case?

5 A It's important to consider urban areas  
6 in this case because there is a significant chance  
7 that the anhydrous ammonia that would be used  
8 would come from an urban area. I consider  
9 Stockton to be an urban area, and I also consider  
10 the South Coast to be an urban area.

11 Q Staff and the Applicant had some  
12 comments on your proposed mitigation measures.  
13 Can you -- I guess we can take each one in turn.  
14 The first was your recommendation that aqueous  
15 ammonia rather than anhydrous be used.

16 Can you address their comments on  
17 aqueous versus anhydrous?

18 A Well, I -- I think I went over a lot of  
19 that in the Hazardous Materials section, but to  
20 recap, we all agree that the probability of an  
21 accident involving aqueous ammonia would be higher  
22 than the probability of an accident involving  
23 anhydrous ammonia, because you have to use more  
24 trucks because aqueous ammonia is 80 percent  
25 water, typically. So you'd need to bring more

1 trucks in.

2           However, the consequences are a lot  
3 lower for aqueous ammonia because you're dealing  
4 with a solution of water that's got 19 or 20  
5 percent, or whatever, ammonia in it. So when you  
6 have a spill you're going to release less ammonia  
7 into the atmosphere than you would in the case of  
8 anhydrous ammonia.

9           Q     What about the other environmental  
10 problems that Mr. Radis was concerned about, like  
11 spills into creeks and things like that?

12          A     Yes. The -- the point was made that in  
13 the case of a spill of aqueous ammonia, because  
14 it's a liquid, that if there were a creek nearby  
15 that you would then result in adverse impact on  
16 aquatic biota, which could certainly happen. But  
17 the same thing could also happen with anhydrous  
18 ammonia, because, as I testified previously, when  
19 you have an anhydrous ammonia spill, although some  
20 of it does flash, not all of it flashes. You get  
21 some pooling, as well, and you could still have  
22 runoff from an anhydrous ammonia spill into a  
23 creek.

24          Q     The -- I believe it was Mr. Radis that  
25 stated that he didn't support your proposed

1 mitigation for the CFA transportation requirements  
2 because standards are always evolving. Can you  
3 respond to that?

4 A Standards are always --

5 Q That over the 30-year life of the  
6 project there could be new standards that would  
7 supersede those.

8 A The CFA program is a voluntary program,  
9 and it's not based on standards. The CFA program  
10 was implemented because the existing LORS for the  
11 transportation of hazardous materials are very  
12 poorly enforced, and they don't work very well.  
13 So the CFA put together a program that is more  
14 aggressive than the existing regulations that  
15 includes some oversight. And the program is far  
16 from being cast in stone. The California  
17 Fertilizer Association very aggressively looks at  
18 that program and revises it as needed.

19 Q Do you think that imposing the CFA  
20 conditions on the project are better than nothing?

21 A They're certainly better than nothing.

22 Q Do you have any comments to make about  
23 their comments on your steel cylinder proposal?

24 A No. I pretty much agreed with the  
25 comments Mr. Radis made on steel cylinders.

1           Q     Do you have anything else you'd like to  
2     respond to?

3           A     Give me a minute.

4                 Yeah. I would like to respond to one  
5     thing. In my written testimony I presented an  
6     analysis of a anhydrous ammonia accident based on  
7     the Sunrise case, which used the FEMA screening  
8     guidelines, which used generic accident rates.

9                 And Mr. Radis in his written testimony  
10    did a more detailed analysis. He argued that that  
11    was only a screening analysis, and that we did  
12    after all have in this Chevron Gaviota study,  
13    Exhibit 32, actual accident rates for a good  
14    portion of the route that would be used by  
15    anhydrous ammonia tankers. And he made an  
16    alternate calculation that resulted in a lower  
17    probability of an accident, which I didn't have  
18    any problem with.

19                The -- the thing that I would like to  
20    point out, though, is that Mr. Radis' calculation  
21    was for a delivery from Stockton. And if those  
22    same calculations were made for a delivery from  
23    the South Coast, you would get a much higher  
24    number because the accident rates in the various  
25    segments of the roads that go through the South

1 Coast are a lot higher than they are along the  
2 road segments coming from Stockton.

3 Q To clarify for the record, Dr. Fox, do  
4 you believe it's appropriate to apply a  
5 probability analysis to transportation risks?

6 A I do believe it's appropriate to apply a  
7 probability analysis to a transportation accident.

8 Q Anything else you'd like to respond to?

9 A I think I'd like to respond to Mr.  
10 Tyler's use of the 8.1 times 10 to the minus 9  
11 tanker miles that were used in his supplemental  
12 transportation testimony, on page 3.

13 Q Again, that -- can you provide the  
14 reference for that?

15 A Yes. The reference for that is Lees  
16 Loss Prevention in the Process Industries, Volume  
17 2, Chapter 23, Section 23.6.6 on releases.

18 The first thing I'd like to point out is  
19 that that rate was actually developed for the  
20 transportation of LPG, not ammonia. And I believe  
21 Mr. Tyler's written testimony said it was  
22 specific to ammonia.

23 And second, I'd like to point out that  
24 Counsel was right in her interpretation. It is a  
25 probability for a puncture type accident.

1           Q     Are there other types of accidents that  
2     could occur, versus puncture?

3           A     Yes.

4           Q     Could you explain those?

5           A     Well, if a tanker rolled over and a  
6     valve burst, you could have a release from a  
7     valve. Or in a catastrophic accident, like a  
8     tanker falling off of a freeway overpass, you  
9     could have the whole tank container burst open.  
10    And I believe that latter case was what was  
11    analyzed in the Sunrise case.

12          Q     Are there any other issues you'd like to  
13    respond to?

14          A     The only other thing I would like to say  
15    is at the end of Mr. Radis' testimony he had some  
16    recommendations on reasonable mitigation measures  
17    that A.D. Little had proposed in other cases, and  
18    I'd like to say that I agree with them all.

19               MS. REYNOLDS: That's all we have for  
20    now.

21               HEARING OFFICER WILLIAMS: Thank you.

22               Cross?

23               MS. LUCKHARDT: Yes, just a couple of  
24    questions.

25               ///

1 CROSS EXAMINATION

2 BY MS. LUCKHARDT:

3 Q In fact, right there towards the end,  
4 Dr. Fox, I thought you -- you said, and correct me  
5 if I'm wrong, that it is appropriate to do a  
6 probability analysis of transportation accidents?

7 A Yes.

8 Q Is that correct?

9 A That's right.

10 Q Then I'm having trouble, because that  
11 seems to be in conflict with your testimony on  
12 stationary sources, when you said that a  
13 probability analysis should not be taken into  
14 account because accidents happen.

15 A Well, the main reason that I support a  
16 probability analysis for a transportation scenario  
17 is that there are a number of different routes  
18 that you could use to bring in the ammonia, and  
19 the accident rates along different road segments  
20 vary. And one of the reasons for doing that kind  
21 of analysis would be to identify the safest route,  
22 if you would.

23 I -- I wouldn't take it the next step  
24 and advocate applying the probability to the type  
25 of accident that might occur with a tanker. I was

1 thinking only in terms of the probability of  
2 accidents along various roadways, and using that  
3 kind of analysis to -- to route the ammonia to the  
4 site, if you will. It's fairly commonly done. I  
5 think it's reasonable.

6 Q Okay. I guess I'm still having  
7 difficulty because in -- in the one hand, you're  
8 stating that it's okay to do a probability  
9 analysis on a transportation accident, and on the  
10 other hand it's not permissible to do a  
11 probability analysis for a stationary tank. And  
12 it -- it seems to me that one should be consistent  
13 in that area.

14 A Well, once you've picked the route I  
15 think it's reasonable to assume that if an  
16 accident occurs, then you look at the consequences  
17 and attempt to mitigate it. In the case of a tank  
18 it's stationary. You're not bringing the tank in  
19 from different locations. It's sitting in one  
20 place. And what you want to know is what's going  
21 to happen to receptors around the tank in the case  
22 of an accident.

23 Likewise, in the case of a  
24 transportation scenario, once you've picked your  
25 route, then the next question would be what's

1 going to happen if you have an accident. And in  
2 that case it would be appropriate to say take a  
3 catastrophic tanker truck failure and look at the  
4 consequences of that on downwind persons, totally  
5 independent of the probability that that tank is  
6 going to burst.

7 Q But it seems to me that you're  
8 requesting a probability analysis regardless of  
9 what route might be taken.

10 A No, I am suggesting a probability  
11 analysis to determine the route.

12 Q As I review your testimony, Dr. Fox, it  
13 -- it seems that you would prefer the use of  
14 aqueous ammonia over anhydrous ammonia. Is that  
15 correct?

16 A That's correct.

17 Q And do you base that conclusion -- you  
18 base that conclusion in -- in the transportation  
19 area on the transport issue, transporting  
20 anhydrous ammonia; is that correct?

21 A No. I base it on both transport  
22 considerations and onsite accidents, like a tank  
23 failure.

24 Q So --

25 A In both of those cases you would have

1 much less severe consequences if you were using  
2 aqueous ammonia, as opposed to anhydrous ammonia.

3 Q So then is it the combination of both,  
4 or is it individually?

5 A You mean the -- the combination of  
6 transport --

7 Q Your determination of significance, is  
8 that based upon transportation alone, or is it  
9 based upon -- if you just look at the  
10 transportation of anhydrous ammonia, would you  
11 still -- would you find a significant impact based  
12 upon transportation alone?

13 A Of aqueous ammonia --

14 Q Anhydrous. Transportation of anhydrous  
15 ammonia to this site.

16 A If you isolated --

17 Q I believe that you have found -- it  
18 seems, from my reading of your testimony, that you  
19 found a significant impact in that area.

20 A Yes. If you isolated an accident  
21 involving only the transportation of anhydrous  
22 ammonia, I believe that would be significant.

23 Q Then would you always recommend the use  
24 of aqueous ammonia instead of anhydrous ammonia?

25 A In most cases, yes. I would imagine

1       that if you had a situation where the anhydrous  
2       ammonia suddenly appeared on the middle of a  
3       desert island, and there weren't any people  
4       around, then anhydrous ammonia would be fine. But  
5       in any case where you have the potential to expose  
6       receptors surrounding the location of the tank, I  
7       would recommend aqueous ammonia.

8           Q     Are you familiar with the Sutter Power  
9       Plant case?

10          A     With some limited aspects of it, yes.

11               MS. REYNOLDS: I would object to that.  
12       Dr. Fox was not a witness in the Sutter case, and  
13       there is no reason to bring that up.

14               MS. LUCKHARDT: I am simply referring to  
15       the facts that are stated in the decision of the  
16       Sutter case. I'm using it as an example. She has  
17       stated that she would always recommend the use of  
18       aqueous ammonia, and the Sutter facility has been  
19       permitted to use anhydrous.

20               MS. REYNOLDS: Dr. Fox has had --

21               COMMISSIONER MOORE: Yeah, I --

22               MS. REYNOLDS: -- nothing to do with  
23       Sutter.

24               COMMISSIONER MOORE: -- Dr. Fox,  
25       actually I was there, since I rendered the opinion

1       on that. And so I'm going to sustain the  
2       objection.

3               MS. LUCKHARDT: I guess I'm finding an  
4       inconsistency in CURE's position, in that in this  
5       case they are taking the position that it is  
6       always -- that they would never recommend the use  
7       of anhydrous ammonia, and they have, in the end,  
8       supported the Sutter case, which uses anhydrous  
9       ammonia.

10              COMMISSIONER MOORE: Well, again, I'm  
11       going to sustain the objection, and simply note in  
12       passing that, to my recollection, Dr. Fox was not  
13       before me when I conducted those hearings. So --

14              MS. REYNOLDS: And for the record, I'd  
15       also like to state that CURE never made any  
16       statements supporting the use of anhydrous ammonia  
17       at the Sutter project.

18              COMMISSIONER MOORE: Again, you know  
19       what, I'm just going to -- I'm going to strike  
20       that, and just -- and ask it not to be in the  
21       record. It's not relevant here, and -- since I  
22       can plumb my own memory base of what happened in  
23       Sutter. And we'll go back to you, Counsel.

24              MS. LUCKHARDT: That's all I have at  
25       this time.

1 COMMISSIONER MOORE: Thank you.

2 MS. REYNOLDS: I have a little redirect.

3 COMMISSIONER MOORE: Let me turn to  
4 staff for --

5 MS. WILLIS: For cross?

6 COMMISSIONER MOORE: -- for cross.

7 MS. WILLIS: Yes.

8 CROSS EXAMINATION

9 BY MS. WILLIS:

10 Q Dr. Fox, what percentage of the route  
11 from Stockton to the project site would you  
12 consider an urban area?

13 A Do you want to know exactly?

14 Q Well, I believe Mr. Radis testified  
15 something like 85 percent was --

16 A I think Mr. Radis said 90 percent.

17 Q Urban?

18 MS. REYNOLDS: Actually, Dr. Fox -- you  
19 can come to your own conclusion. I don't want you  
20 necessarily adopting his assumptions.

21 THE WITNESS: It's a small percentage.  
22 You know, ten percent, maybe, 15 percent. I'm not  
23 certain. I could look in this report and give you  
24 an exact number.

25 ///

1 BY MS. WILLIS:

2 Q Actually, my question is did you  
3 calculate the percentage on your own,  
4 independently?

5 A No, I did not.

6 Q Okay. Thank you.

7 Do you consider the routes in Kern  
8 County densely populated?

9 A Not outside of the Bakersfield area, no,  
10 I don't consider it to be densely populated.

11 Q Have you reviewed staff's Conditions of  
12 Certification?

13 A Yes.

14 Q On page 132 of staff's Final Staff  
15 Assessment, Transportation 3, the project -- it  
16 states the project owner shall ensure that all  
17 federal and state regulations for the transport of  
18 hazardous materials are observed during both  
19 construction and operation of the facility.

20 Have you reviewed that condition?

21 A Yes.

22 Q Now, you state in -- on page 3 of your  
23 testimony -- excuse me -- transportation  
24 regulations relied on staff are poorly enforced.  
25 And you also indicated that today. What is the

1 basis for your statement?

2 MS. REYNOLDS: Can you -- she didn't  
3 hear you.

4 THE WITNESS: I -- I only missed your  
5 last sentence.

6 BY MS. WILLIS:

7 Q What is --

8 HEARING OFFICER WILLIAMS: Do you need a  
9 break, Counsel?

10 MS. WILLIS: Just -- just one second.

11 HEARING OFFICER WILLIAMS: Why don't we  
12 go off the record.

13 (Off the record.)

14 BY MS. WILLIS:

15 Q The last part of the question was what  
16 is the basis for your statement?

17 A Which statement?

18 Q That transportation regulations relied  
19 on staff are poorly enforced, and you also  
20 mentioned earlier in your testimony that LORS are  
21 not -- are not enforced.

22 A The basis for my statement is basically  
23 my experience. I've had a lot of conversations  
24 with the California Fertilizer Association, and  
25 its contractors who implement the CFA program.

1 And when you talk to folks intimately involved in  
2 that program, what you will find is one of the  
3 reasons that that program was instituted is  
4 specifically because the LORS are not enforced.

5 Q And you have no other basis except for  
6 conversations that you've had?

7 A Conversations with people involved in  
8 enforcing LORS and also implementing the CFA  
9 program, yes.

10 Q Do you believe that driver's training,  
11 fleet maintenance, and speed monitoring can  
12 influence accident rates?

13 A Could you repeat that?

14 Q Excuse me. Do you believe that driver's  
15 training, fleet maintenance, and speed monitoring  
16 can influence accident rates?

17 A Yes.

18 Q Has there been a trend that individual  
19 carriers have taken actions to implement  
20 mitigation measures to reduce the likelihood  
21 and/or severity of trucking accidents?

22 A Through the CFA program, yes.

23 Q And you -- anyone else?

24 A I have not looked outside of California.  
25 The CFA program is pretty widely used within

1 California.

2 Q I can refer you back to your Exhibit B  
3 of your testimony, page 82. There's a paragraph,  
4 2.3.5, accident trends with time. Does that refer  
5 just to CFA?

6 A Let me -- I'm sorry, what page was that  
7 again?

8 Q It's 82 of Exhibit B, the excerpt.

9 A What is this out of -- oh, this must be  
10 out of the transportation bible.

11 Q Right. I was going to say I think it's  
12 out of the bible.

13 A Now, I have it in front of me. Which --  
14 are you referring to 2.3.5?

15 Q Right, title, accident trends with time.

16 A The overall rate of trucking accidents  
17 have been relatively constant over time.

18 Q Actually, I'm not asking you to read it.  
19 I'm just asking you to look at that --

20 A Well --

21 Q -- section. Does that refer to just  
22 CFA?

23 A Well, then let me read it to myself.

24 Q Thank you.

25 A No, that does not refer just to the CFA.

1           Q     Okay.  Thank you.

2                     On page 3 of your testimony, the second  
3     paragraph -- let me -- you state, and let me see  
4     if I can find it -- that -- I think it's the first  
5     -- you state, transportation regulations relied on  
6     by staff are poorly enforced and focus largely on  
7     hardware procedures.  Do you see that part?  It's  
8     kind of half -- a little over halfway down.  It  
9     starts with finally, transportation regulations.

10          A     I see it.

11          Q     Okay.  It states, transportation  
12     regulations relied on by staff are poorly enforced  
13     and focus largely on hardware and procedures  
14     rather than -- than the principal causes of  
15     accidents.  And then you go on, human error, and  
16     other things.

17          A     Correct.

18          Q     You go down to the third paragraph, and  
19     the bottom, you -- you talk about that staff's  
20     analysis did not use standard procedures followed  
21     by other agencies.

22          A     Correct.

23          Q     Concluding at the end, the last sentence  
24     of that paragraph, the results are then used to  
25     identify hardware systems and procedures to reduce

1 both consequences and risk. It seemed to identify  
2 that staff's procedures should follow some sort of  
3 method that would result in reduced identifying  
4 hardware systems and procedures.

5 So I guess I'm confused at the  
6 inconsistency. Are hardware procedures important  
7 in consideration?

8 A I'm not sure I understand what the  
9 question is.

10 Q On this third paragraph, you state the  
11 staff analysis did not use standard procedures.  
12 And then you go on to describe the procedures that  
13 should be followed, and the results that should  
14 occur.

15 A Okay.

16 Q And that's to identify hardware systems  
17 and procedures to reduce the risk and --  
18 consequences and risk.

19 A Yes.

20 Q But the paragraph above, you state that  
21 that isn't something -- that transportation  
22 regulations relied on by staff look at those  
23 things, and rather than something else.

24 So I guess -- I guess I'm just -- we  
25 were very confused by -- it seemed contradictory

1 to us, and we were just trying to ask for  
2 clarification.

3 A Let me think about this for a minute and  
4 try to give you an answer.

5 I see why you're confused. The second  
6 paragraph seems to contradict what's in the third  
7 paragraph. I think I see what your confusion is.  
8 Give me a minute to think of an answer.

9 Q Actually, I don't have any further  
10 questions. If you want to wait until rebuttal to  
11 answer that, that's fine. I think just the --

12 HEARING OFFICER WILLIAMS: I think she's  
13 just about to clear it up, and then we'll move on  
14 to redirect.

15 THE WITNESS: The first place, where the  
16 phrase hardware and procedures occurs, probably  
17 shouldn't have said that because staff's analysis  
18 didn't rely on hardware and procedures. It looks  
19 like there's some kind of typo editorial problem  
20 going on here.

21 So let me just clarify for the record  
22 that what staff did was identify the roads in the  
23 immediate vicinity of the project that would be  
24 used by ammonia tankers. And they made physical  
25 observations --

1 BY MS. WILLIS:

2 Q Actually, I'm going to object to this.  
3 That really isn't my question. My question was  
4 just were those -- what was the consistency of  
5 those two. And I don't -- I think that what  
6 you're saying is that they actually aren't  
7 consistent and that shouldn't have been in there.

8 A Right. And --

9 Q That satisfies my --

10 A Okay.

11 Q -- my question.

12 I just had one more, and this is just to  
13 -- you refer to somewhere exhibit -- you keep  
14 saying to Exhibit 2. Is that part of this case?

15 A Exhibit 2.

16 Q And where did I -- I saw that quite a  
17 few times in here. Oh, I guess it's page -- page  
18 1, Appendix B to Exhibit 2. What is Exhibit 2?

19 A Page -- could you point me to where you  
20 are on page 1?

21 Q Page 1, first full paragraph under Roman  
22 numeral I.

23 A Appendix B -- that refers to the LNG  
24 A.D. Little transportation study, which is in --

25 Q Actually, that question is, is there an

1 Appendix B in this? I mean, we have Exhibit B.

2 Is there an Appendix B?

3 MS. REYNOLDS: I think it's appendix to  
4 one of the exhibits. I think the 2 is wrong.

5 MS. WILLIS: Oh, okay.

6 MS. REYNOLDS: It's probably a typo.

7 COMMISSIONER MOORE: Maybe you can tell  
8 us at the end of this, or at our next meeting.

9 MS. WILLIS: Right. That's -- we were  
10 just a little confused as to what that reference  
11 was to.

12 COMMISSIONER MOORE: Is that your last  
13 question, Counsel?

14 MS. WILLIS: That's it.

15 COMMISSIONER MOORE: All right. Do you  
16 have redirect?

17 MS. REYNOLDS: Just two brief questions.

18 REDIRECT EXAMINATION

19 BY MS. REYNOLDS:

20 Q Dr. Fox, do you think it's appropriate  
21 to use probabilities to assess the consequences of  
22 a release during an ammonia transportation  
23 accident?

24 A No, I don't.

25 Q So could you clarify what you meant when

1       you thought -- when you said you thought it was  
2       appropriate to use probabilities to identify the  
3       transportation route?

4           A     Identifying the transportation route  
5       doesn't involve any consequences from an accident.

6           Q     Can you go further and --

7                   HEARING OFFICER WILLIAMS:  Counsel, I --  
8       personally, I think it's pretty clear.

9                   MS. REYNOLDS:  Do you -- okay.  Do you  
10      understand -- I -- okay, I wasn't sure if that was  
11      clear to you.

12                   BY MS. REYNOLDS:

13           Q     With respect to page 3 of your  
14      testimony, did you want to clarify what you  
15      intended to say?  You said that there may have  
16      been some kind of error?

17           A     Yes.  On page 3 of my testimony, in the  
18      sentence that reads, finally, transportation  
19      regulations relied on by staff are poorly enforced  
20      and focus largely on -- let's strike "hardware and  
21      procedures," and replace it with "visual  
22      observations of local roadways", rather than "the  
23      principal causes of accidents, human error,  
24      equipment failure, system or procedural failures  
25      and external events."

1 COMMISSIONER MOORE: And that's what you  
2 meant to say all along.

3 THE WITNESS: I know it's hard to  
4 believe, but that's what's correct.

5 MS. REYNOLDS: I'd like to note for the  
6 record also that Mr. Tyler's supplemental  
7 testimony was provided after we submitted --  
8 excuse me, we submitted our testimony, so --

9 MS. WILLIS: Actually though, it wasn't  
10 in response to a question that there were  
11 contradictory comments made. I think that's --  
12 that would be our objection, is that the testimony  
13 was changed in response to -- that pointed out  
14 that there was some contradictions.

15 MS. REYNOLDS: I'm sorry, I didn't  
16 understand that.

17 MS. WILLIS: Mr. Tyler provided his  
18 testimony at the time he gave his direct, not in  
19 response to cross.

20 MS. REYNOLDS: Oh, no. Correct. I just  
21 meant that in -- when Dr. Fox -- Dr. Fox's  
22 critique of staff's analysis in her testimony,  
23 which was filed on the 12th, was filed before we  
24 had received Mr. Tyler's supplemental  
25 transportation testimony, which did a probability

1 analysis, whereas one was not performed in the FSA  
2 originally. So --

3 COMMISSIONER MOORE: Your point is done.  
4 Thank you.

5 All right. Recross, Counsel?

6 MS. WILLIS: No, none.

7 COMMISSIONER MOORE: Counsel?

8 MS. LUCKHARDT: No.

9 COMMISSIONER MOORE: All right. Here we  
10 come to a decision point again. And I think what  
11 I'm going to have to do is err on the side of,  
12 regrettably, pushing back Waste Management, the  
13 final topic until Tuesday. So that's what we're  
14 going to have to do. That's February 1st.

15 MS. WILLIS: Excuse me. Does that  
16 include Worker Safety, as well?

17 COMMISSIONER MOORE: Yes. I'm sorry, I  
18 said the final topic. I meant -- I just assumed  
19 that everyone was looking at the same sheet I was.

20 And so we will take those up. I intend  
21 to start at 9:00 o'clock on Tuesday. And are  
22 there other housekeeping items that we ought to be  
23 made aware of?

24 MS. LUCKHARDT: I'd like to request that  
25 the record be closed on Traffic and Transportation

1           and Hazardous Materials.

2                   COMMISSIONER MOORE:   Any objections?

3                   MS. REYNOLDS:   No.

4                   MS. WILLIS:   None.

5                   COMMISSIONER MOORE:   All right.   Thank

6           you all for bearing with, and we'll see you at

7           9:00 o'clock on Tuesday.

8                   (Thereupon, the Hearing was adjourned

9           for the day.)

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## CERTIFICATE OF REPORTER

I, VALORIE PHILLIPS, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Hearing; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said Hearing, nor in any way interested in the outcome of said Hearing.

IN WITNESS WHEREOF, I have hereunto set my hand this 7th day of February, 2000.

VALORIE PHILLIPS

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